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February 1991

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ON THE COVER: top right corner—a superb concours interior (photo by Yamil Sued). Above right—the excitement of the Kyosho 1/8-Scale World Challenge (photo by Bill Koliopoulos). Center—the Schumacher Cougar (photo by Steve Pond). Lower left—MRP Miss Bud hydroplane (photo by Steve Pond). Upper left—the Kyosho Porsche 911 (photo by Steve Pond).

EDITORIAL

"THE MORE THINGS change, the more they stay the same." This little piece of wisdom has been passed down through the generations, and although I don't know who originally said it, he must have been an R/C racer!

In the age of microprocessors, we're constantly looking for better, faster ways of doing everything, and this is true with R/C car designs and the electronics that guide and power them. They're all lighter, stronger, faster, generally better, and yes, more expensive than before. Our desire for a competitive edge has driven us and R/C manufacturers into a "technoblitz" that has resulted in racing accessories that seem to have no limit, either in performance or price.

In certain circles, many of our cars are going faster than most of us would admit we're capable of handling, and your competitive edge is determined by the depth of your pocket. It's not like the old days when you strapped a pack in your car for life and pitted your skills against those of other drivers; now you're racing against their wallets as well. That's where "the more things change" part comes in. Racing has certainly changed over the years, but now it's time to look back.



Recently, some track owners and racing organizations have created a racing form that's reminiscent of the old days. The investment in hardware is fixed and inexpensive, and the emphasis is on the drivers' skills. A prime example is an effort by one of our local tracks. To get people into racing for a minimum investment, the 540 Sport Class has been initiated by track owners Richard and Barbara Paris of R/C World in Danbury, CT. They plan to put together a package for about \$250. Using a Bolink Eliminator Sport as the chassis, the package will include a Futaba Magnum Sport radio system with a Futaba electronic speed controller, a Trinity Equalizer or Mabuchi 540 motor, a 6-cell stick pack, a Protech 702 charger, and they'll even throw in a can of paint. The car will only be allowed to use bronze bushings (which are inexpensive to replace), foam tires, stick packs and possibly a range of three pinion gears. Wings aren't allowed. The details haven't been ironed out yet, but they're making a concerted effort to reduce racing costs and to bring racing back to those who are talented drivers—not Wall Street investors.

It's encouraging that people like the Paris clan are interested in helping this sport to grow. They should serve as models for official racing organizations. The high-tech stuff is plenty of fun, but grassroots racing is where it's at. If you own a track or know of one that could use racing like this, don't wait for one of the racing organizations to grab this concept. Take the initiative, and get something going yourself. It will strengthen our hobby, and all will benefit. I'm not suggesting that the entire racing program be converted to this format, but if this type of program is added to your schedule, it could open the doors to many who might otherwise not have become involved.

Steve

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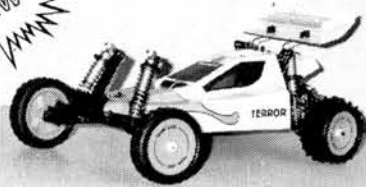
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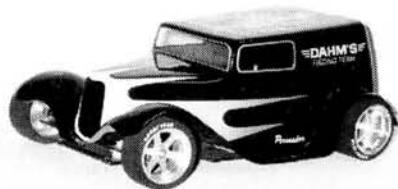
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LETTERS

DIEHARDS AND BEGINNERS

I'm a loyal reader of your excellent mag, and I can't wait for the next issue. I want to take a stand on the monster-truck controversy: I agree with Rob Pegler that "fun trucks" aren't competitive—not at my track, anyway.

Recently, we started a separate class for inexperienced off-roaders, and it has worked out great for the "diehards" and the "beginners." I love to race and have spent hard-earned money on competitive trucks. My JR-XTs and Lazer are equipped with "budget electronics," but I win my share of races. Before we started this new class, these "fun trucks" raced with conversions and angered the diehards. There's nothing more irritating than spending money to race (and taking the time to prepare a truck for the Main), only to be taken out by a kid trying to drive his Monster Beetle in a straight line!

I own a Blackfoot and have a lot of fun at the beach with it, but it stays home when I go to the track. A separate class is the way to go.

ROB JONES
Edgewater, MD

OK, Rob, separate classes are probably the way to go, but remember that dealing with less experienced drivers is part of racing, and learning to maneuver around any obstacle—a newcomer or a major pile-up—is what separates a good driver from a great one. Don't expect everyone to get out of your way because you're Mister Jones. Besides, with the right car, one of these "kids" just might kick your butt!

CC

LOCAL CONTROL

I'm glad to see someone in Steve Pond's position bring up the subject of a specification class as a way to control the cost of racing (September '90 Editorial).

For three years, I've been telling nearby hobby shops and clubs that they should control the cost of racing for beginners, and I suggested starting a spec class in which only one particular car can race.

When I was stationed in Korea, we ran an indoor spec class and only allowed the cheapest Korean-made car. Cars and parts were readily available; new people joined every weekend; and it was a great success.

Back in the States, though, stock and modified "no-holds-barred" racing are all there is. To be competitive, you have to spend as much as the winners do. Most beginners don't stay around because their pocketbooks can't handle it.

ROAR's Production Class *should* have been the solution to the high cost of racing, but it isn't, because most club and hobby-shop tracks don't run this class. Besides, a production Grasshopper just isn't competitive against a production RC10, and the "beer-can" motor supplied in most car kits is no match for a ROAR-legal stock motor. ROAR can change its rules, but it's really up to the hobby shops and clubs that control the racetracks to start a spec-class racing series and make it work. (In the long run, the spec class would have to be standardized so you wouldn't need to buy a new car every time you went out of town to race.)

An affordable class—where people can learn how to set up and drive their cars without going broke—is essential for the continued growth of our hobby.

ALTON L. DOBBINS
Shaw AFB, SC

Al, you hit it on the head. The key to spec racing is the local level. We keep getting letters asking about rules, and I keep saying, "It doesn't matter; make up your own." But we keep getting more letters: "Can you give us rules?" So, I guess we'll have to publish some very simple rules in a Car Action IROC Road and Off-Road Series to start the ball rolling. If you have any ideas, please write to me—anybody!

CC

EAGLE vs. JR-XT

I've been into R/C cars for about a year, and I enjoy reading *Car Action*. I'm thinking of buying a racing truck, and I want to know which you think is the best.

I'd like to see a racing-truck shootout, or a shootout between Team Losi's JR-XT and the Traxxas TRX-T Eagle—like the one between Kyosho's Double Dare and MRC/Tamiya's Clod Buster in your April and July issues.

TOMMY SMYTH
Iroquois, Ontario, Canada

Tom, watch for our '91 "Monster Truck Special," in which we "shoot out" all trucks, including the available racing trucks.

CC

ARABIAN RACERS

I'm stationed in Saudi Arabia for Operation Desert Shield. A few of us have been sent *Radio Control Car Action* by people in the States. We're very interested in buying off-road racers, but we know nothing about them. One question has arisen: are there pistol-grip radios for left-handed people? Thanks for your time and assistance.

ALAN K. ROBINSON
APO NY

Alan, I'm going to send you some copies of *Car Action* and a "Buyers' Guide" so you can have a "crash course" in R/C car racing. Monster trucks are probably the thing to get into, considering Saudi Arabia's sandy topography, and Airtronics XL2P, CS2P and Caliber radios are all reversible for lefties. If you have any questions about starting a club, write to me, or call—if you can.

CC

WHICH JOHNSON IS IT?

I just picked up the December '90 issue of your magazine, and as usual, it was awesome. In the Track Report on the Traxxas TRX-T Eagle (in the "Dallas Debut" inset), you stated that Tom Owens was in a battle with "Magic Man" Joel Johnson. Is this right, or did Tom Owens really beat Jack Johnson? Please set me straight, and tell Chris Chianelli that his hair rules.

CALE HAND
Rock Falls, IL

Cale, it was Jack, not Joel, Johnson—sorry about the typo.

CC

KILLER KING

I have a Tamiya King Cab with Sees aluminum rims and DuraTrax diamond spiked tires. Is there anything that would soup-up this truck, e.g., gears, motors, tires?

RON GLENN
Fort Lauderdale, FL

Ron, one of the most successful modifications is to beef-up the diff with a Robinson transmission gear set specifically for the King Cab and Hi-Lux. Of course, using better shocks (like Kyosho Golds) and trying different combinations of Pro-Line Red, Losi and Shumacher tires will help greatly, too.

CC

FOUR WIRES TO THREE

The Track Reports in your magazine are excellent. The one testing the TRX-T Eagle (in the December '90 issue) convinced me that it was the best, and I've decided to get one. I plan to use a Novak T-4 speed controller, and I'd like to know how well it will stand up to a modified motor and what problems I might have with a hot setup. I often hear of controllers that have been modified to use only three wires. Does this require modifications to the insides, or do you just chop off the extra positive wire? I would really appreciate the answers. Thanks!

NATHAN GRIFFIN
Crosbyton, TX

Nathan, your decision about the Eagle is a good one, but you should wait for the new Blue Eagle. I own an Eagle and have had great results with it, but the Blue Eagle's tranny is much better. (If my response comes too late, don't worry; Traxxas sells an upgrade kit to convert the Eagle to use the new tranny.)

(Continued on page 18)



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PUBLISHER'S PAGE

by LOUIS DeFRANCESCO, JR.



At the local R/C flying field, Publisher Louis DeFrancesco, Gerry Yarrish (center) and Tom Atwood (right) test a modified "Klingberg Flying Wing." This superfast electric wing is capable of diving speeds in excess of 100mph. and it's powered by an AstroFlight cobalt motor and Trinity pushed Ni-Cd cells—the same type of power sources you'd use in your R/C car. R/C flying can be wild, too! Gerry is the associate editor of Radio Control Boat Modeler, and Tom is the editor-in-chief of Model Airplane News (R/C Car Action's sister magazines). Tom's aerobatic-flight skills put that slippery wing through some spell-binding stunts!

BY THE TIME you read this, the 1990 holiday season will be over, but, without a doubt, I never saw so much advertising of R/C products in major national mail-order catalogues and on prime-time television.

Radio Shack, Cox, Tyco and others blitzed TV viewers with R/C goodies ranging from monster trucks to ready-to-fly airplanes. Monolithic mail-order merchandisers (The Sharper Image, Hammacher Schlemmer, Spiegel, Nieman Marcus, Sears and many more) featured multiple pages of R/C cars in their catalogues, and major department stores boosted advertising and dedicated more shelf space to the hobby. Toys "R" Us and Nikko together ran full-page color ads in "USA Today" featuring their R/C lines. I even saw an R/C truck in a Chevy Lumina TV ad! The R/C industry will benefit greatly from this media barrage.

Some will argue that much of the R/C merchandise advertised on this grand scale is of "toy" quality and not up to "hobby" standards; they think that consumers will eventually be frustrated and lose interest because of the products' "inferior" quality. I'm convinced otherwise; I think that these ads send a strong "radio-control" message to consumers and expose even more of them to the possibilities of our hobby/sport. The news is out!—and R/C is being recognized at the national level. It's time for the industry to capitalize on this exposure.

I firmly believe that, in the '90s, the R/C hobby will continue to grow and gain more acceptance; long after other "fads" have entered into their twilight, we'll still be rollin'!

READERS' RIDES

In "Readers' Rides," we recognize the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah chooses your photo, you'll receive a one-year subscription to Car Action, or an extension to your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1991. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.

GOLIATH

The latest in six-wheeled slayers comes from Ricky Ko of Naperville, IL. This conversion was remarkably simple; only 10 screws are required to de-convert! Several chassis mods help to keep the wheels stuck to the ground, and the Triple Matched Madness motors are hooked up to a household light switch! In its first pulling competition, the truck took 1st place with a full pull of over 170 pounds! That effort broke the track record of 156 pounds. Talk about brute force....!



OO, FAHRVERGNÜGEN!

Out of the mind of Stefan Reichmann (of Weissenhorn, West Germany) and onto the pages of Car Action comes this wild-looking Volkswagen Golf GTI 16V. We don't know much about the car, but it's based on a Robbe kit and Stefan used spare parts to complete it. Its surprisingly scale look stands out. This GTI is sure to excite you!



LOOKIN' GOOD

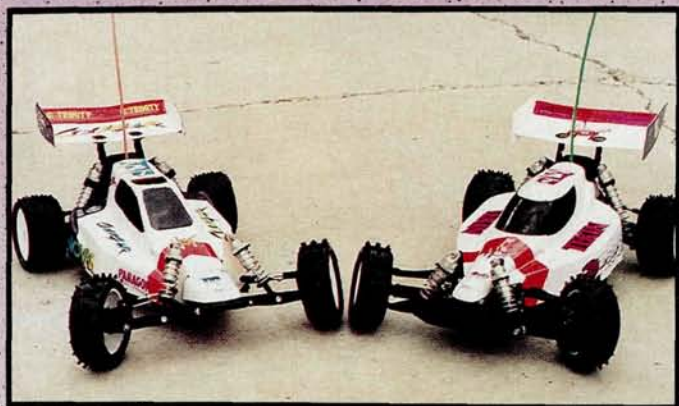
A diehard fan of Harry Grant and the Skoal Racing Team, J. Bryan Howle Jr. (of Oswego, NY) decided to cover his Hyper 10 with a nicely detailed body just like that of his favorite #33. Bryan didn't neglect his car's inside, either; he added an assortment of Tekin equipment and a Texas Connection stock motor. He even uses a trailer to keep the car in pristine condition when it's idle.



START YOUR ENGINES!

Bud Rice of Lakeland, FL, has definitely been bitten by the gas bug. A great example of a fine-tuned racing car, his New Era 1/4-scale stocker has a polycarbonate (not fiberglass) body, a high-volume

air filter and a radical handmade exhaust system. Bud says it was "ultra-quick" right out of the box! With a paint job like that of Patty Moise's Busch Grand National car, this fine machine is ready to take on Talladega or Daytona at the drop of the green flag!



REAL PURR-TY!

Scott Maggard of Yakima, WA, can't get enough of those crazy Cats! On the left is his mostly stock Cougar and on the right is his Pro Cat. Novak equipment controls the Cougar, and a Tekin 700 relays the power to the Pro Cat's Torkzilla motor. With pro diffs and matching paint jobs, these cars are definitely the cat's meow!



THE HIGHEST FORM OF FLATTERY

Kevin Brister (of San Diego, CA) modeled his custom-built, 1/10-scale road car after one of the perennial favorites in IMSA GTP racing—Jan Lammers' Castrol-sponsored Jaguar XJR-9. Based loosely on an Agitator 2.0, Kevin's car is equipped with a Corally ESC and a Quarterflash motor—a potent combo that has helped him win "quite a few" A-Mains!

KEEP OUT OF THE WATER!

This photo comes all the way from the Netherlands! Gerrit Schuiter's King Cab has a host of Tamiya-made modifications, like a Technigold motor and an Adspeck radio with ESC. He and his fellow Dutch R/C fanatics don't have a local track, so they've taken to racing on an unfinished harbor; as long as there's no water, the running is great! Their main purpose differs from that of most clubs—fun, not competition. Way to go!



INSIDE SCOOP

by CHRIS CHIANELLI

SLOT

Are you won-
dering what slot
CAR with R/C rac-
turers and racers now involved with R/C
in the slot scene. That's me at age 12—known as
Chianelli—in the magazine section of the New
York Times. Slot-car fame
did then—and it's all real!!
This year, on March 23 and 24, Parma will stage
Cup and Slot Reunion Race at Mac's Tom Thumb Raceway in Columbus, OH. This is an
open invitation for everyone involved in slot-car racing to
get a movement going to promote the resurgence of slot
racing. Those wishing to reminisce about the "old
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CAR

REUNION

RACE



Sunday NEW YORK NEWS

Concentration is the
keynote as Chris
Chianelli, 12, of
Farmingdale, controls racer's power
via rheostat.



AUTOGRAPHICS INDY SERIES

Autographics of California needs no introduction, but its new
Indy Car Series decals certainly do. The company plans to pro-
duce an extensive line of decals expressly for R/C Indy car rac-
ing. Here's the Autographics Alfa Romeo/Miller Genuine Draft
decalsheet. This decal pack also contains a scale drawing that
shows the appropriate paint scheme and decal locations. This
will help concours-trophy seekers to authentically duplicate a
full-size car. This is very welcome, since there aren't too many
available detailed shots of Indy cars. Bruce Wilson, president of
Autographics, says these useful scale drawing sheets might be
included with some stock-car decals, too.



**FIRE
POWER
F1**

We have very little info, but it seems clear that Cox is using its 1/12-scale Nissan GTP glow-power technol-
ogy to develop this (and probably others, he said mysteriously!) 1/10-scale Formula 1 Fiat F189. My
beautiful spy in the Far East sent me these pictures, but her
transmissions were cut short for reasons un-
known. We must all pray for
her safe return to me—I
mean us, and the
Car Action cause (you
readers, of course!).



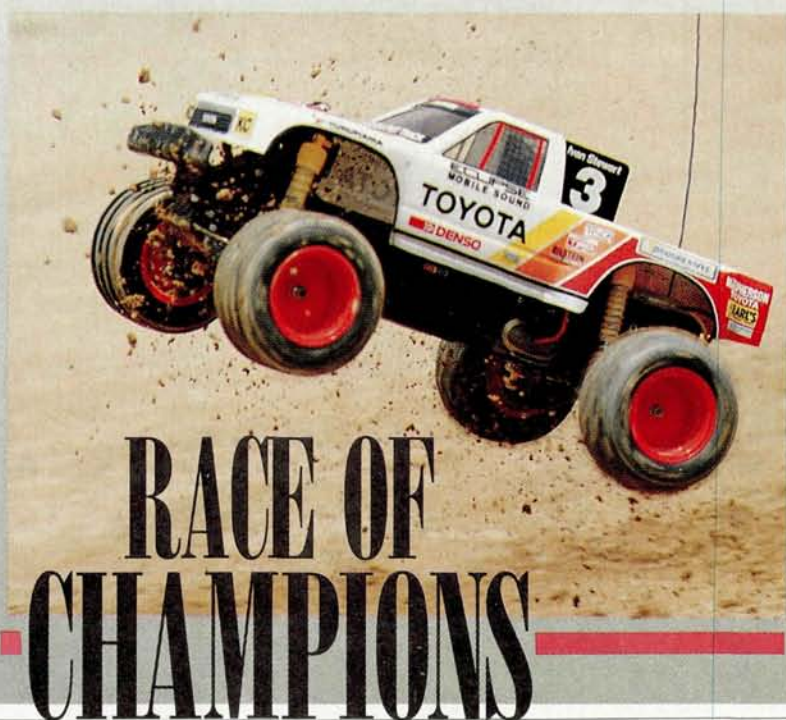
**WE'RE
COOL...
WE'RE
COOL!**



Trinity has entered the marine motor market with this new motor. It has a machined-aluminum water-cooled endbell that directs the flow right over the brush hoods. This motor ran at the Chicago Model Hobby Show for four days, driving an underwater prop. With cooling from this new endbell and from the can-coil, it never even got warm! With this endbell and SCI's water-cooled electronic speed controller, a liquid-cooled "endurance" car is a possibility. Now, where can we get a 1/10-scale radiator?

MRC / TAMIYA & CAR ACTION

On March 9 and 10, at the RCHTA Show in Pomona, CA, a selected group that includes some of the country's top drivers will compete for cash prizes. The races will be a test of the drivers' skills, because they'll all run identically equipped Tamiya racing trucks, and the cash prizes will be donated to the winners' favorite charities. To see who wins, keep your eye on the pages of *Car Action*.



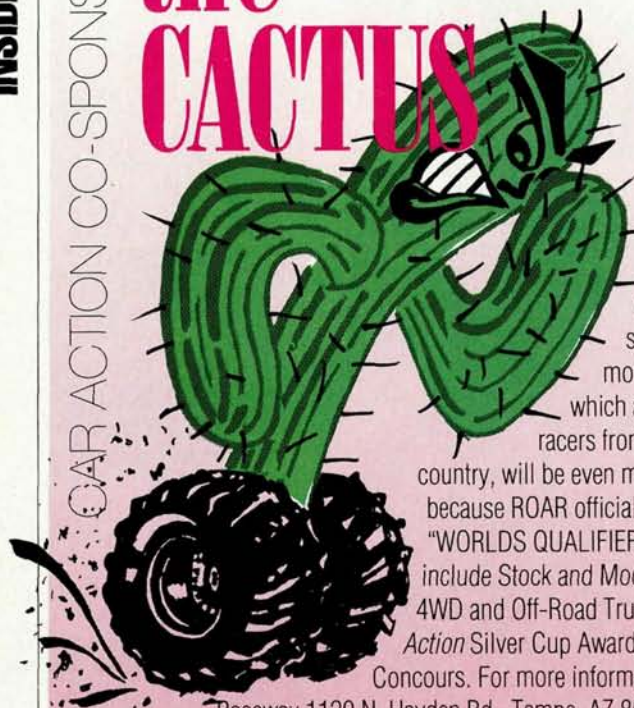
RACE OF CHAMPIONS

TRX PRO TRANNY

All right, all right; get off my back! So the picture of the "new Traxxas tranny" in my December "Scoop" was really a picture of a full-size Range Rover tranny—so what! I got your attention, didn't I? So shut up! Anyway, the new, more compact PRO Series tranny incorporates both a slipper clutch and an externally adjustable ball diff. The low 2:72 final drive ratio is specifically for use with racing-truck wheels and tires. Traxxas claims that the tranny's self-lubricating 48-pitch gears are quiet and smooth. (Standard 3/8-inch-i.d. spurs gear will also fit to increase the ratio range from 6:1 to 20.40:1.) For owners of older Eagles, Traxxas will offer a transmission upgrade kit, so don't whine about not having the new tranny. The kit (part no. 1919) will include all the necessary parts for upgrading the tranny and the steering bellcrank. Bought separately, these parts would cost almost \$90, but you can buy the kit for \$50 (no trade-in necessary).



the CACTUS



The 5th annual Pro-Line Cactus Classic is a huge race held in the Southwest, and this year, on March 14 to 17, *R/C Car Action* will be a co-sponsor. It's rumored that this race, which always pulls 300 racers from all over the country, will be even more competitive because ROAR officials will make it a "WORLDS QUALIFIER." The classes will include Stock and Modified in 2WD, 4WD and Off-Road Truck, and the *Car Action* Silver Cup Award will be given for Concours. For more information, contact SRS Raceway 1120 N. Hayden Rd., Tempe, AZ 85281. Coordinator: Mike Dolan (602) 829-9117.



DAHM BOLTS ON

Daring Ira Dahm of Dahm's Racing (winner in *Car Action's* 1990 "Ten Best") introduces these new, 1/10-scale Pontiac Grand Prix and Ford Thunderbird NASCAR bodies. These aerodynamic, highly detailed bodies include something new—bolt-on, adjustable rear spoilers. The .030 Lexan bodies also have screened vents, hood pins, windshield clips, rear window straps, gas caps and 3D intake vents molded into the side windows. Sounds hot! We'll see!



REEDY

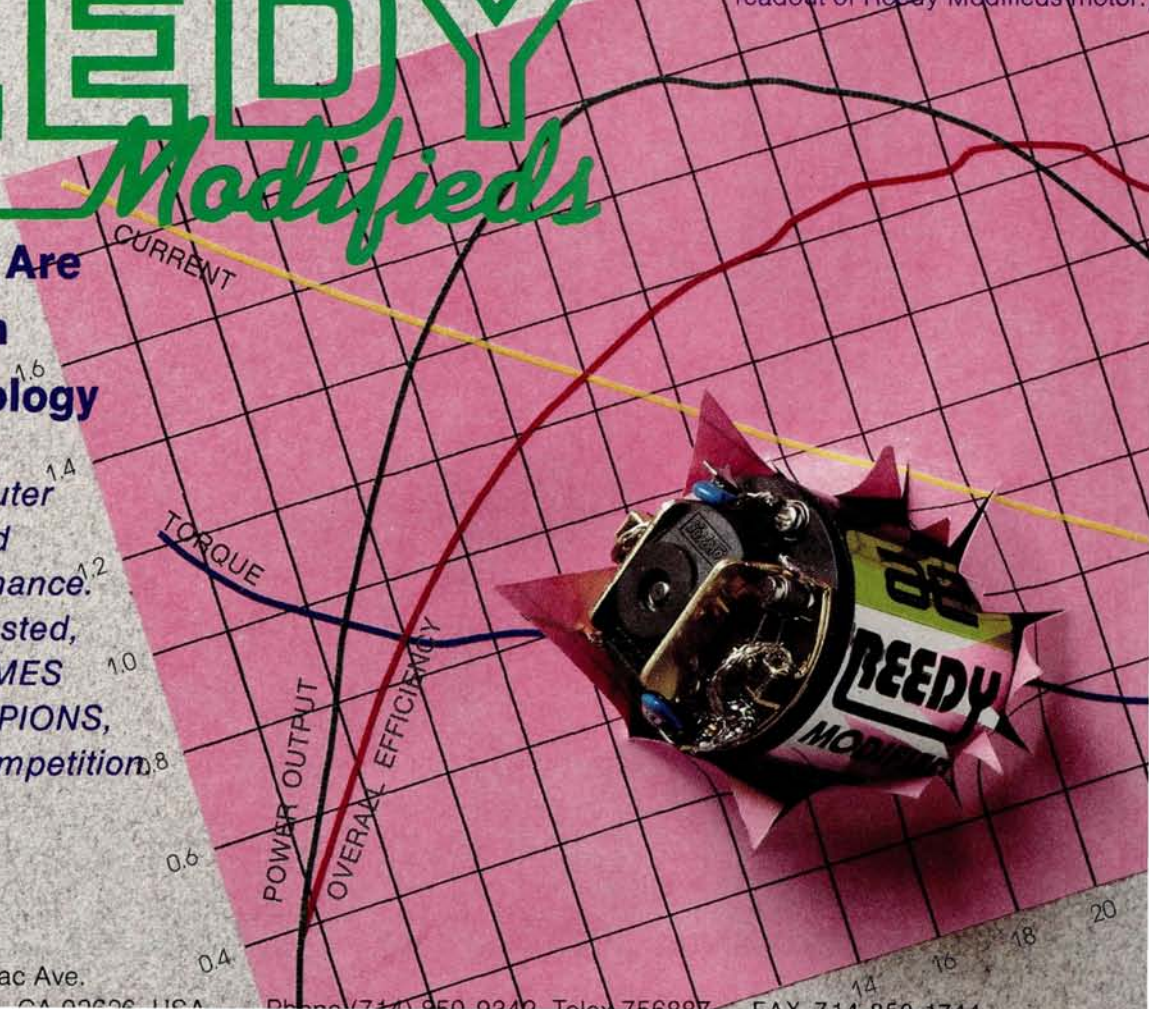
Modifieds

Reedy Modifieds Are Bursting Through With New Technology

Reedy Modifieds uses advanced R & D computer systems to develop and improve motor performance. Race developed and tested, Reedy motors are 4 TIMES IFMAR WORLD CHAMPIONS, leaping ahead of all competition.

Reedy Modifieds.
The Outburst of New Technology.

(Graph shown represents actual coreadout of Reedy Modifieds motor.)



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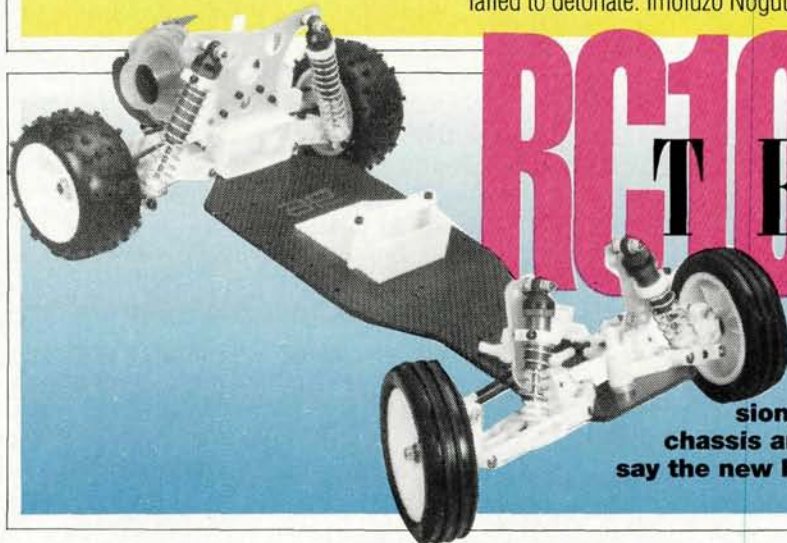
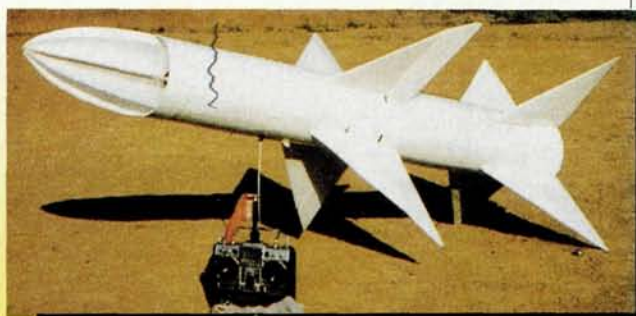
FAX 714-950-1744

SORE LOSER'S RETRO-BUTION

It seems that one of the seven Japanese experimental R/C solid-fuel rockets fell into the hands of Imoluzo Nogutzo—a former Japanese off-road racer. Two years ago, Nogutzo was thrown out of every Japanese racing organization because he always cheated. He's the only officially sanctioned Japanese racer who has *never* won any regional, and at the last

Nationals (held in the suburbs of Osaka), he loaded the rocket with triethelmonomethanol (swamp gas) and launched this stink bomb directly

at the winners' circle. We hear that the miasmic missile came within inches of Masami's head and lodged in the roof of a grass hut, but failed to detonate. Imoluzo Nogutzo is still at large—and considered smelly-armed and dangerous!



RC10 TEAM CAR

Here's Team Associated's official RC10 Team Car. The package naturally includes the coveted Stealth tranny, hard-anodized Teflon shocks, wide-track front suspension, zero-offset steering blocks, a graphite chassis and the new Viper Lexan body. Factory reps say the new kit "packs all the latest secrets of the team."

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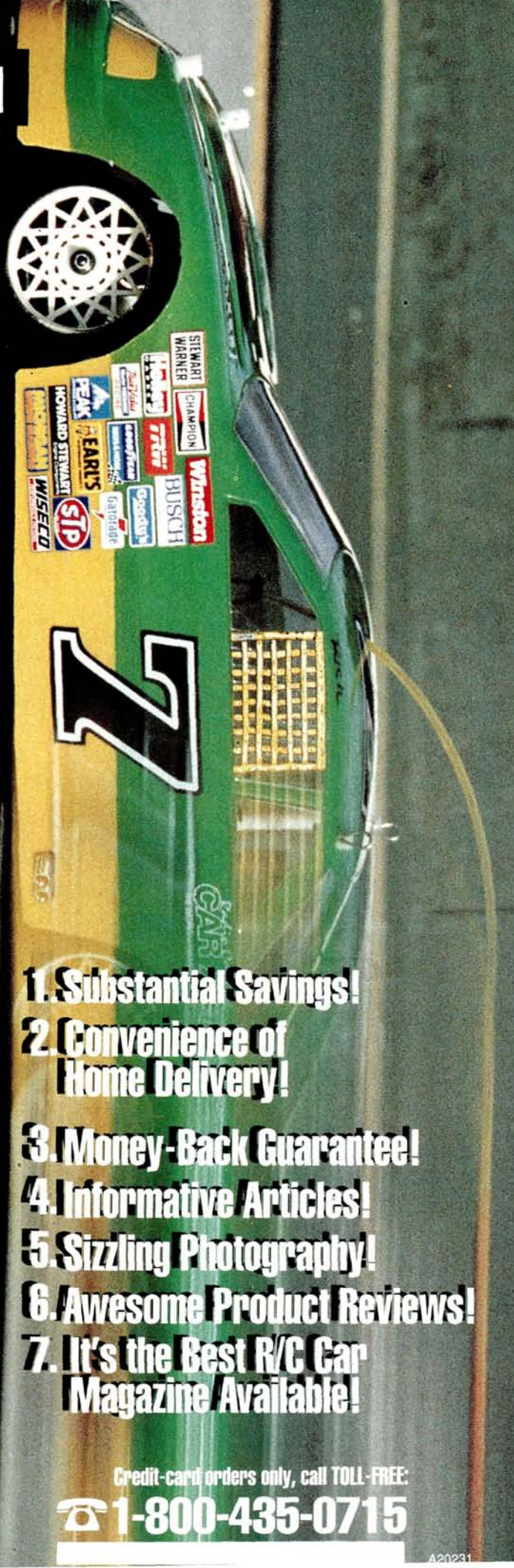


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LETTERS (Continued from page 9)

The Novak T-4 will perform reasonably well with a modified motor, but it might run a little hot. I tried a T-4 in my Eagle and couldn't run as long as I did with my 411P. Because of their high-speed switching rate and three-wire setup, the new controllers are more efficient.

Your question about three-wire speed controllers is a good one. If you were to open a controller and follow the two red wires to their destinations, you'd find them soldered to the same spot. This means that power from the battery flows into the unit and is sent right back to the motor. The only reason the red wires enter the speed controller is to supply the radio system with the voltage it needs to function.

By eliminating one of the wires and running a direct line from battery to motor, you reduce the controller's resistance and increase its efficiency. You can cut the wire, or remove the solder. I don't recommend that you open a speed controller if you don't have any experience with them, however. JH

PEAK UNIDEN DECALS

I need your help! I've been desperately looking for "Peak Uniden" decals for my car, but I can't find any. Peak isn't going to sponsor Kyle Petty's Winston Cup car next year, and I'm afraid I'll never be able to find the decals. Can you help me with some names and/or numbers?

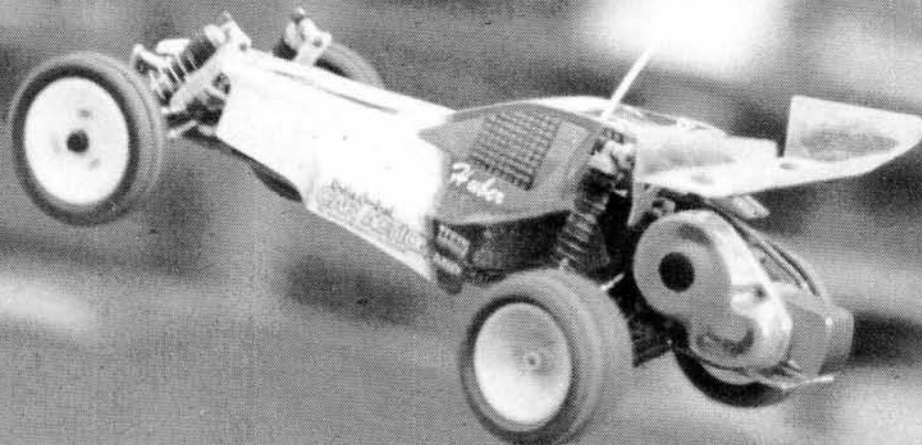
You have a great magazine; keep up the good work! Thanks for your help.

MARK G. MOLZAHN
Appleton, WI

Mark, I called Autographics to see if they had the decals you want. They told me that they had planned to release them, but canned the idea when they heard that Kyle wouldn't be racing for Peak next year. If you really want the decals, give Custom R/C Graphix a call at (212) 324-7858; I'm sure they can help. JH

WHERE TO WRITE TO US

If you're writing to us (and we'd love to hear from you), please be sure to address your letters to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to us in Connecticut, and this leads to long delays.



RC hyperdrive

by JOHN HUBER

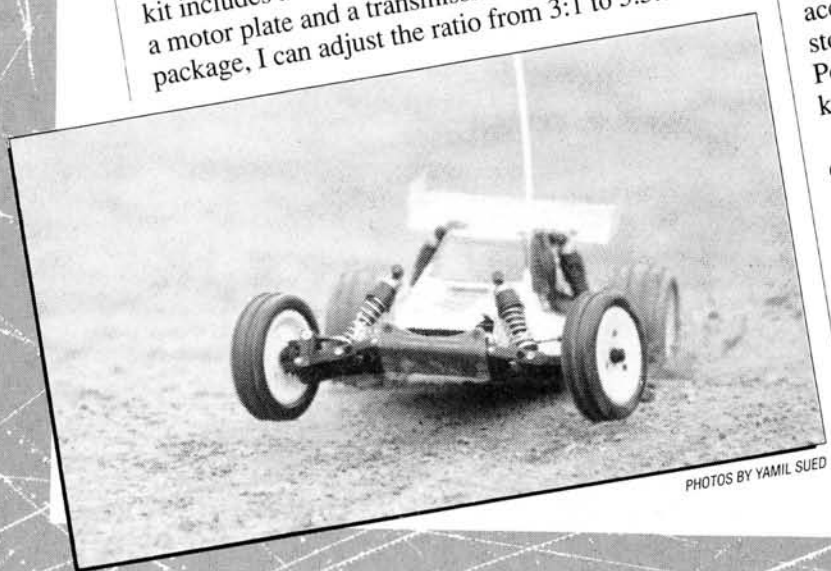
WHAT DOES IT take to make your car fast and efficient?—a smooth drive system. Since many cars benefit from a belt-drive system, I decided to try one in my Associated* RC10. Hyperdrive* makes a complete belt conversion system that uses the existing transmission. The kit includes a set of belts, diff pulleys, pinion pulleys, a motor plate and a transmission case. With this package, I can adjust the ratio from 3:1 to 5.5:1.

H Y P E R S P E E D

PARTS PARTS PARTS

To complete the drive train, I also used a Thorp* 48-pitch gear set, which is more efficient than the 32-pitch gear set. Assemble the gearbox according to the RC10 manual, and replace the stock gears with those from the Thorp set. Dr. Pond highly recommends the Jammin' Jay* diff kit, so I included it in the package.

With the belt-drive system, the pinion and the diff pulley rotate in the same direction, so you must use reverse-direction motors or build the transmission backwards. Since there are more normal rotation motors available than reverse motors, I built the gearbox backwards. Hyperdrive supplies a polycarbonate gear cover for each option. The thick motor plate provides a stiff mount for the motor, and it requires a slightly modified, machined case. In my kit, one of the gearbox cases wasn't machined properly, and I had to use shims so that the plate would align properly with the belt. The motor must be parallel to the diff shaft.



PHOTOS BY YAMIL SUED

HYPER-CHAMP

For the test vehicle, I used the Championship RC10 (see the December '90 issue), which I then modified. Using Cliff Lett's technique, I lightened the chassis slightly, and I replaced the standard shock bodies with MIP's* hard shock bodies. I also used the SCI* Power-card for this project. According to the instructions, the bottom surface is the heat sink on this unit. I applied a thin layer of heat-sink compound, and using two antenna mounts as clamps, I mounted the controller to the chassis.

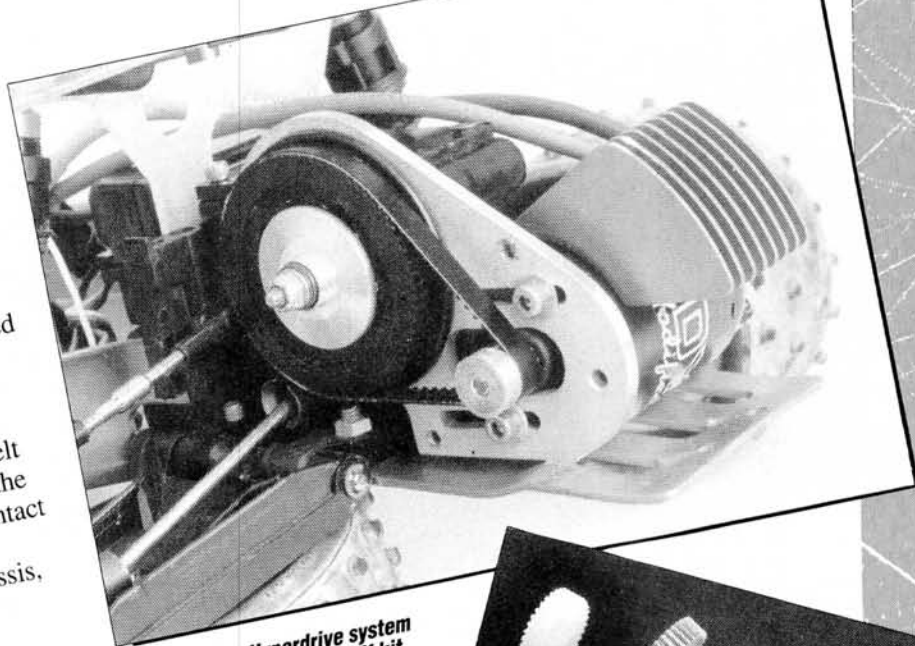
It's unusual to have the motor on the right side of the car, but it poses no problems. The motor plate has been extended to improve belt operation. With a greater distance between the motor and the tranny, the belt has better contact with the pulleys. This isn't a problem on a graphite RC10, but with an aluminum chassis, the rear must be flattened.

HYPER-ACTIVE

Off-road racing was over for the season, so I didn't have a chance to test this setup in competition. Instead, I went to a nearby baseball diamond one night after work. I noticed a big difference the moment I touched the throttle. I could no longer rely on the sound of the car to locate it in the dark, and at about 10 feet, the whine of the motor blended into the background traffic.

When I tried the car in an adjacent parking lot where the lighting was better, the car really showed promise on the smooth pavement. As it whizzed by, all I could hear was the sound of the knobby tires. As a transmission-class on-road car, it will be tough to beat. Acceleration

The author chose to build the tranny backwards so that he could use normal-rotation motors (mounted in reverse), see text



Above: The Hyperdrive system with the Jammin' Jay diff kit makes for an extremely smooth drive train. Note the extended motor plate and the part of the chassis that's bent down to accommodate it.

Right: Thorp's 48-pitch gear set replaces all the internal gears with high-quality steel and nylon gears.

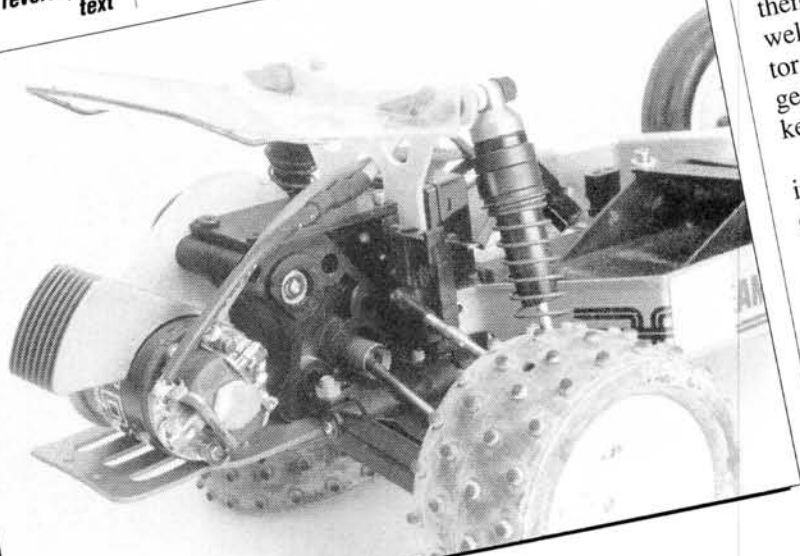


was smooth and showed no signs of belt slippage, but I'll have to wait until spring to put this belt-drive system to the test on an off-road track.

The parts in the Hyperdrive kit are of topnotch quality. You must, however, check the alignment of the motor plate with the tranny. It takes a little time to properly align them. The polycarbonate gear covers are a welcome addition, but they don't fit the motor plate perfectly. Dirt that gets under the gear cover will eventually destroy a belt, so keep everything clean.

The Hyperdrive conversion turns the RC10 into a silent, but deadly, competitor. Look out, because you won't hear me coming.

**Here are the addresses of the companies mentioned in this article:*
Associated Electronics, 3585 Cadillac Ave., Marina Del Rey, CA 90292.
Hyperdrive, 3210 Howard Nickell Rd., Fayetteville, AR 72703.
Thorp Mfg., 380 S. East End, Unit H, Pomona, CA 91766.
Jammin' Jay Halsey Products/Team Losi, 1655 E. Mission Blvd., Pomona, CA 91766.
MIP, 838 Edna Place, Covina, CA 91723.
SCI Corp. of America, P.O. Box 13099, Sarasota, FL 34278.



WELL, THE NEW YEAR IS HERE, AND SO IS ALL THE NEW STUFF. THE SELF-EXALTED "EXPERTS" ONCE AGAIN TRIED TO GET ATTENTION WITH SCARY PREDICTIONS, BUT WITH ALL THE NEW HIGH-TECH AND LOW-BUCK STUFF, THE HOBBY IS IN GREAT SHAPE. NO, WE DON'T SEE R/C CONSUMERS FRANTICALLY YELLING, "I'LL TAKE TWO DOZEN OF WHATEVER YOU'VE GOT IN AN R/C CAR!" HOW LONG COULD THAT GO ON? WE DO HAVE A MORE MATURE, DIVERSIFIED HOBBY AND NEWCOMERS WHO ARE BETTER INFORMED.

OFF-ROAD TRUCK RACING IS A PERFECT EXAMPLE OF THE CURRENT "EXPLOSION." THE ULTIMA OUTLAW, THE TRAXXAS HAWK, THE SCHUMACHER SHOTGUN, GLOBAL'S 1/10-SCALE

PEAK STADIUM TRUCK AND JG'S SRT STADIUM TRUCK ARE ALL NEW FOR '91. AMONG MANUFACTURERS, DIVERSIFICATION IS ONLY PART OF

ONES WHO MAKE THIS WHOLE THING HAPPEN.

MANY COMPANIES HAVEN'T FORGOTTEN THIS, AND THEY'VE ALREADY STARTED TO AN-

THE "LEAST EXPENSIVE 4WD" BUGGY, AND IT HAS A FEW INNOVATIONS, AND TRAXXAS' NEW HAWK IS A VERY INEXPENSIVE OFF-ROAD TRUCK THAT CAN BE

UPGRADED WITH EAGLE PARTS.

SO WHAT IS ALL THIS LEADING UP TO? AFFORDABLE PROD-

NEW

FOR

'91

THE STORY. THE TRUE SURVIVORS HAVE ALREADY STARTED TO ADAPT TO A FAR MORE IMPORTANT CALLING—THE CONSUMERS' POCKETBOOKS! SURE, THERE WILL ALWAYS BE A GUY WHO'S WILLING TO LET LOOSE WITH \$1,000 FOR A SUPERSPEEDWAY CAR, BUT YOUNGER OFF-ROAD RODEO LOVERS ARE THE

SWER THE CALL FOR LESS EXPENSIVE PRODUCTS. LOSI'S JUNIOR TWO IS AN EXAMPLE: A LOT OF RESEARCH AND MONEY WENT INTO PROVIDING A RESPECTABLE CAR FOR RACERS ON A BUDGET. THIS KIND OF EFFORT IS AN INVESTMENT IN OUR SPORT.

TAMIYA'S NEW MANTA RAY IS BEING TOUTED AS

UCTS ARE OUT THERE IN ABUNDANCE, AND SO IS THE WILL TO COMPETE. WE JUST NEED TO AGREE ON COMPETITION RULES CONCERNING THESE RESOURCES—BUT THAT'S ANOTHER STORY, AND THE FINAL CHAPTER HAS YET TO UNFOLD.

by CHRIS CHIANELLI

**NEW
FOR
'91**

TAMIYA BULLHEAD



The Tamiya Bullhead is basically a Clod with a strengthened chassis, but it still causes a stir with its semi-tractor body. It's already a favorite among pullers and crusher fans. The kit includes beautiful bolt-on chrome.



AIRTRONICS CALIBER

The Caliber radio system features a high-contrast liquid-crystal display, user-friendly soft keys for easy data

input, a proportional third channel and easy-to-adjust analog timers. Airtronics touts the Caliber as "the world's first fully computer-programmable pistol-grip radio."



TEKIN MOTOR

DYNO 900

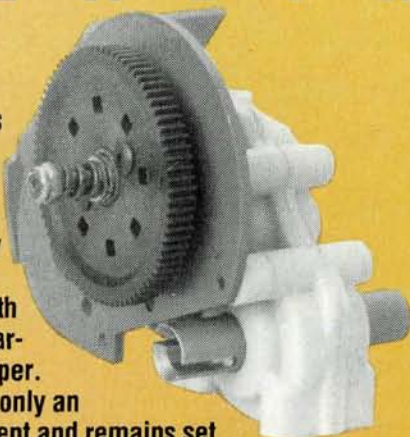
The Dyno 900 features a built-in, fully regulated power supply. It will run off any 12V 25A source, and it has an electronically regulated load that gives consistently accurate readings. Torque is measured in inch/ounces, and power output is measured in watts or horsepower. Unlike most dynos, the Dyno 900 doesn't rely on a calibrated slave motor. Any slave motor stock or mod may be used without affecting readings.

S T E A L T H

ASSOCIATED

After a year of secrecy, Associated has released its new "Stealth" tranny, which features a fully enclosed ball differential with sealed ball bearings and a slipper.

The diff needs only an initial adjustment and remains set until it's disassembled. The kit has everything you'll need, including a motor mount and a template to show where the holes should be drilled.



ANDY'S PRO RACE KIT

Andy's R/C Products—a leading manufacturer of polycarbonate bodies—now offers the Pro Race Kit for the RC10. This isn't just

another chassis kit; it's almost a complete car. Included are front and rear bulkheads, an Andy's molded-graphite chassis, one front and two rear shock towers, front and rear A-arms, rear trailing arms and a bellcrank steering system. After buying the kit, you only have to buy a tranny and hardware.



VICTOR IQ-FET SC



Want an affordable, small, light, smooth-at-any-speed speed controller with the lowest voltage drop? The Victor Engineering IQ-FET computerized speed controller has automatically adapting neutral, high point, throttle and steering deglitching, neutral dead-band, motor pulse rate. The steering signal is routed through the unit for deglitching so that steering and throttle channels can be used for communication from the transmitter to the IQ-FET. Six LEDs in the controller make this possible.



GLOBAL 1/10-SCALE GAS TRUCK

the 1/10-scale gas line, it comes with a Magnum, Schnuerleported, .10-size, pull-start glow engine.

This Peak stadium truck is one of Global Hobbies' newest offerings. Like the rest of

HYPERDRIVE H10SC



a 3-point suspension rear pod, metal minishocks, no bump-steer linkage geometry, a lighter chassis, a bolt-on quick-change battery modification, full ball bearings and an adjustable wheelbase are just a few of its features.

Hyperdrive has introduced the H10SC, a 1/10-scale pan car. Already well-known on the high-speed-oval and on-road circuits,

CONTROLLERS SCI SPEED



SCI's new electronic speed controllers feature SMD technology on high-quality fiberglass epoxy board with what the manufacturer calls "thru-the-hole" plating. Developed by Austrian engineers, there are six controllers in the SCI line, including a water-cooled unit called the "Nautic Card" and the Pullman, which is supposed to have a 1,900A peak capability.

LOSI JUNIOR TWO

Without a doubt, Team Losi's Junior Two was the hit of the 1990 Chicago Hobby Model Show. Reasonably priced and well-thought-out, the Junior Two has loads of performance goodies that are the results of Team Losi's years of R&D—H-arms, telescopic half-shafts and JR-X2 shocks.



STEADY GRIP FROM DAN'S



"Banana Man" Moynihan from Dan's Racing Products offers these stick-on Grip Strips in bright colors. They really help during nerve-racking races!

**NEW
FOR
'91**



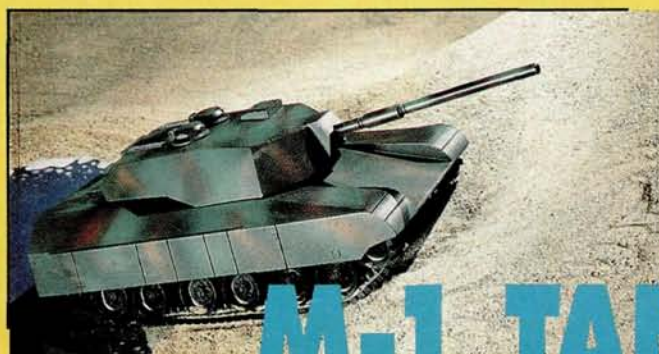
A truck-racing pioneer, JG isn't about to rest on its laurels. The new SRT stadium truck comes with long suspension arms machined from Delron, long graphite chassis, light one-piece JG 2.2-inch wheels and many other competition features. The SRT accepts the new Associated Stealth transmission.

JG SRT STADIUM TRUCK



LOSI GEARS

Team Losi has spent a lot of R&D time and money on its new gear line, and this has paid off. The new Losi super-precise pinions are the best we've seen.



Chicago Model Int'l

Co.'s M-1 tank has two Mabuchi 380 motors so its treads can be actuated independently for scale-like operation. It comes ready to run, and it has a two-stick transmitter—one for each tread.

M-1 TANK

EAGLE'S CALIFORNIA COLOR

Eagle decals include California stripes, swashes, "seismics" and, of course, flames. Apply these brightly colored beauties to the inside of your vehicle—no more scraped, scratched or peeled decals.

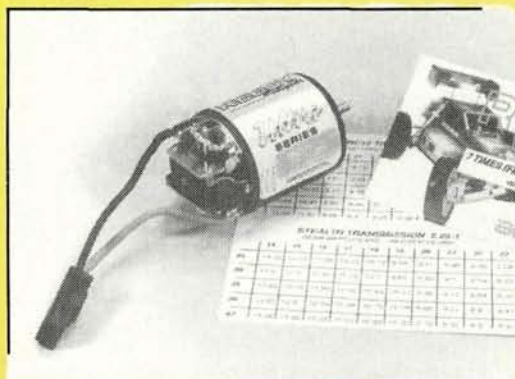


SCHUMACHER SHOTGUN



The new Schumacher Shotgun racing truck has the Cougar's aluminum chassis and suspension parts. Schumacher is taking off-road truck racing quite seriously, and it has introduced a line of off-road truck tires to support the Shotgun. Given the company's good reputation, these tires will undoubtedly show up on other racing trucks.

1/12-SCALE EMERGENCY?



REEDY MODIFIEDS

Known for years as a major motor manufacturer, Reedy has done it again. The new "Mr." Series of modified motors includes the Ultra Torque Magnets that provide racers with a broader power band for increased efficiency. Motors will be available with 12 to 17 turns in a variety of doubles, triples and quads. Their performances at the recent Thunderdrome race speak for themselves.



Along with many other new bodies for '91, Parma offers this 1/12-scale Ford Aerostar van, which is perfect for the Tamiya Lunch Box/Midnight Pumpkin chassis. The "911 EMERGENCY" decals are also new from Parma.

TRAXXAS HAWK



Traxxas's new, inexpensive, off-road racing truck can be upgraded with many of the hot TRX-T Eagle parts, e.g., longer suspension arms. Its plastic/nylon chassis puts it in the same class as Blackfoots and Big Brutes where it should "clean up."



ANDY'S OLDS

From the "professor of polycarbonate" comes yet another creation—the 1990 Olds Cutlass. Its smooth, rounded shape cuts through the wind and evenly distributes downforce. The more defined body lines add detail and help make the body stiffer. According to Andy, his company doesn't use a wind tunnel to test its bodies; performance is tested on the track during competition.



KYOSHO 959

Like its full-scale counterpart, the Kyosho 1/8-scale Porsche 959 is a 4WD vehicle. This new gas-powered beauty has fully independent suspension with oil-filled coil-overs and disc brakes.

**NEW
FOR
'91**

**U
L
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M
A**



Not to be left out of a current trend, Kyosho has converted the Ultima II into an off-road racing truck—the Ultima Outlaw. It has a long-throw, front suspension, oil-filled coil-overs and chassis dirt dams.

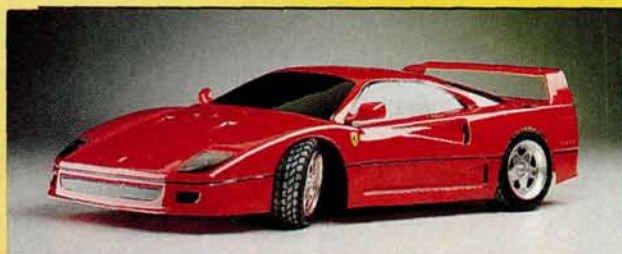
OUTLAW



**TRX PRO
SERIES
TRANNNY**

The new Traxxas Pro Series transmission is standard on all '91 Blue Eagles. It's available at cost to Eagle owners who trade-in their old trannys. This

supersmooth unit has a torque limiter, interchangeable spur gears and an externally adjustable ball diff.



KYOSHO F-40

The Ferrari F-40—Enzo's legacy—joins the Kyosho Porsche 935 and the Nissan SX300 in Kyosho's Scale Series. Like others in the line, the F-40 is based on the Ultima II chassis.



Tamiya's new Manta Ray is not only an all-new design, but it's also touted as the least expensive 1/10-scale 4WD buggy on the market. This car has oil shocks on all fours and a tub chassis that's honeycombed for increased rigidity.

MANTA RAY

PDI XTRA



The new Xtra from PDI may prove to be the most powerful speed controller on the market today. This programmable unit handles up to 36 cells and 315 amps continuous with a 1200A surge capability; all this with a .0026-ohm internal resistance. The Xtra is intended for multiple modified motors.



MINICRAFT POWER TOOLS

This new line of reasonably priced power tools includes high-speed drills, sanders, cordless drills and mini table saws. All run on 12 volts and use standard power supplies or optional units that have "vari-speed" and multiple outputs.

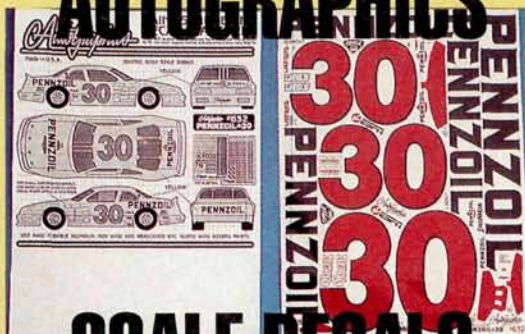
M C A L L I S T E R

FLYING "M" 18-WHEELER



Team McAllister's race-car-carrier tractor trailer uses any 1/10-scale pan-car chassis turned upside-down and mounted under the cab. The trailer has 1/10-scale rear axles and wheels.

AUTOGRAPHICS



SCALE DECALS

Long known for its scale decals, Autographics now offers a guide for painting true-to-scale models of selected, famous, full-scale cars. This information will prove invaluable for concours-trophy seekers. Of course, the decals come with the scale documentation you'll need to produce an authentic scale model. (It tells you where to paint particular colors, where to apply the decals, etc.)

MERCEDES C11

The Tamiya Mercedes C11 is an innovative, 1/10-scale, on-road and street car. The kingpin front springs and the rear T-plate are familiar, but it also has a new, 3-point adjustable wheelbase that fits many 1/10-scale bodies, and its ride height can be adjusted for rougher sites. This reasonably priced car also features oil shocks and a ball diff.



LOSI TEFLON



SHOCK BODIES

Team Losi now offers hard-anodized shock bodies for the JR-X2, the JR-XT and the new Junior Two. They're incredibly durable and provide very smooth shock action.

DIRT DIGEST

by BILL O'BRIEN & BOB KANE

Ground Rules

WAY BACK IN February 1989, when Chris Chianelli (yes, you have him to blame!) first hired us to write "Dirt Digest," Bob and I wanted to come up with a column that would be responsive to your input and would give as much info as possible on what you have to do to improve the current crop of cars and trucks. We think we've succeeded but, to a small extent, we've also failed. That last part concerns you.

We recently received some correspondence that typifies the kind of letters you send. It went something like, "You're the only person who can tell me the part number I need to swap the diff in my Avante for the new-style Egress diff." That's untrue. Anyone with a Tamiya parts book could give you the information. Where can you find a Tamiya parts book? Have you looked in your hobby store? That's what they're there for. (I have three nearby.)

A TALE OF THREE HOBBY STORES

One store charges list price for everything it sells because it has very high overhead costs (an expensive, prime retail spot in New York City). As you might imagine, it's not the first place I go to buy things. If I need something in particular, some little, out-of-the-way part, however, there's a good chance that I'll find it there and that it will be worth its price. I don't go there for advice unless I have a good grasp of the subject and am "stumped" on just one point. I don't go there to learn the basics; I go there to buy, and I hope to learn something. I bought my first car there, and when a part broke after a week, I was referred back to the manufacturer and enjoyed a three-week wait



And you thought we were kidding about having a ton of cars and trucks. This doesn't account for more than a third of them, or even suggest the nine or ten gas cars; six more kits remain unassembled.

for a replacement. You probably have a store just like that in your town.

Another store discounts everything it sells. Its cheaper, out-of-the-way location enables it to compete in the price wars, but when I go in there, I feel like a wallet with hands. "What do you want?...Give me your money...Here it is...Next!" I bought a mechanical speed controller for my Frog from this place, because it wasn't in stock anywhere else locally. You definitely have a store like that in your town.

The third shop is slightly odd. If I'm looking for exotic R/C stuff, this is where I'll find it. It doesn't quite charge list price, but I won't exactly get a good discount, either. The owner talks and steers customers toward his most expensive goods. They're of a better quality, and everything he says about them is true, but they're not necessarily what

you want, and that's your most important decision. From this store, I bought a helicopter that had the special gyro and "trick" items I wanted. I also buy 1/8-scale car bodies there, because there's usually a good selection. It's likely that there's a store like this in your town.

I'm a hobby store owner's dream come true. On average, I spend about \$100 a week on R/C stuff. (I might be on a parts binge to restock my larder, or I might want a bunch of cars so that I can hide away for a month of deep assembly and hard play.) I go nine miles out of my way to spend that money, because my "un-local" hobby shop lets me look around without a salesperson following three steps behind me. If I need to know which parts work with which vehicles, someone always whips out a parts book, looks up the number, finds out whether it's in stock and gets it for me if it is. If it isn't, they order it, and it usually arrives in less than a week.

The owners of the store race both on-road and off-road; they sponsor local races; and whether you know anybody in the store or not, you can ask for advice or tell tall tales. Their prices match or beat most of the mail-order discount places, and they can do that because they sell a lot. They sell a lot because their prices are reasonable and because they know how to deal with customers and their problems. Is anyone in any doubt about why I go out of my way to shop at this store?

GET WITH THE PROGRAM

Your hobby shop is where you learn about kits and parts and the options that you read about in magazines like *Car Action* (all right, there are no other magazines like *Car Action*!) Your dollars keep them in business, and your

dollars tell them whether or not you appreciate how they treat you. They usually get the message. You can even get that kind of service from many of the mail-order companies—just don't try asking for it during the Christmas rush!

In this column, we can't possibly cover individual requests for info that would have little or no significance to most readers. What kind of letters do we want? Well, how about some like the one from Eric Nolte from the "Big Mo"?

Eric has a Royal Ripper with a lot of drag in the gearboxes, and he wants to know if there are any kits to reduce the drag and make his Ripper's speed competitive. Well, Eric, you can forget about the speed part of the request. The car has decent handling characteristics, but it wasn't built for competition. Royal used essentially the same drive system in the Crusher truck and, to reduce drag, they made the truck 2WD. It's meant for fun, and so is the Ripper. Just enjoy it.

Eric also has a JR-X2 and he describes what he *thinks* is severe oversteer. (This problem has earned him a great nickname at his local track, but I can't repeat it here!) As soon as he gives the car some throttle, the back tries to run ahead of the front. I have a Kyosho Penske PC-19 with a Trinity Pole Position motor, and it does exactly the same, but I don't think the car is really oversteering. Apparently, he runs on a hard-packed track that's covered by a thin layer of dust and, although he didn't give any details on his motor, gear and tire combination, that surface is very bad for traction.

Assuming he runs a hot stock or modified wind and has tried every possible shock oil and spring combination (he *has* tried loosening the diff—wrong!), the next step is to try different tires. Small pin-spikes or cleats might work on a dust-covered, hard-packed surface, and for the JR-X2, Losi offers replacements that are "directional." Up front, use ribbed tires that don't dig into

the dirt. If the rear end still breaks loose with throttle, try a larger pinion (one or two teeth) to reduce acceleration off the line. Try these remedies; if they don't work for you, as a last resort, you can move to a slightly less powerful motor.

See what we mean about relevant questions? Eric's question isn't just relevant to *his* car, and few problems affect only *one* particular brand of R/C vehicle, so our answers will be of use to many readers. When you write to us, please describe your car thoroughly. Brag about it!—we need to know every detail, because the less guesswork we have to do, the better our answer will be.

Don't stop there. Which parts are you thinking about putting into your buggy or truck? Wouldn't you like to know in advance *whether* they'll work and *how* they'll work in a given vehicle? Between us, Bob and I have almost every available car or truck, and if we don't actually have the same one as you, the odds are pretty good that we have a similar one. The people at your hobby shop can tell you what a part does, but if they don't actually try it, they won't necessarily know how it works. I'd prefer to spend 25 cents on a stamp than \$30 on a part that I'm unsure of. It makes sense to me—how about you?

NEXT TIME OUT

My Italian mother and Doris Day have a saying, "Que sera, sera."—what will be, will be. Next month will be pot-luck month. I have a bunch of cars to assemble and look over—including a "Bullhead." What a name! (Good thing it's a great truck!) If you want to know what the Bill O'Brien half of this team looks like, look at the Viking on the side of the Bullhead's box (but I don't wear a horned helmet—at least, not usually!).

So sit down and *write!* Today's car owners are more intelligent than ever, and the cars now more high-tech. We need your input, and we're waiting right here. ■

A SPECIAL MESSAGE TO RETAILERS

IMAGINE the benefits of drawing many more regular customers into your store every month. Imagine adding a popular, **profitable**—and returnable—hobby product to your store. By stocking **Model Airplane News**, **Radio Control Car Action** and **Radio Control Boat Modeler**, you'll accomplish both! These are the most informative and entertaining modeling magazines available to the R/C consumer—and they're in tremendous demand. These magazines will actually stimulate more sales of R/C airplanes, cars, boats and accessories for you.

If you don't already stock Air Age magazines, please call us toll-free, and we'll let you know how they can make money for you.



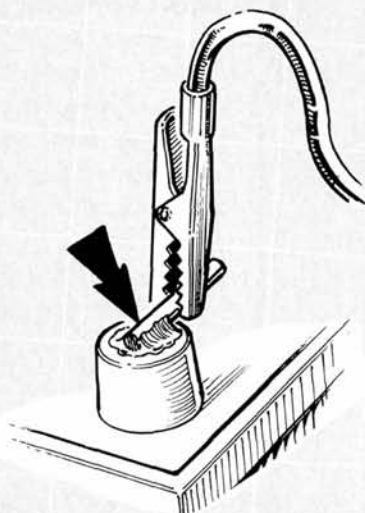
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PIT TIPS

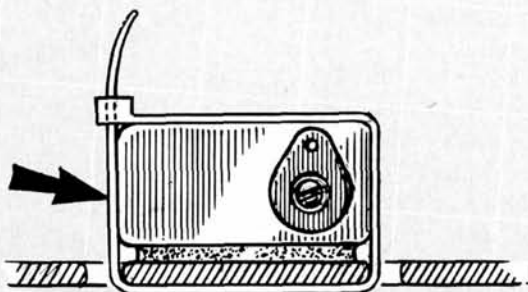
by JIM NEWMAN



SMALL CLIPS ON BIG BATTERIES

If you solder two pieces of brass or copper rod onto the terminal posts of a car battery, you can use the small alligator clips that usually come with field chargers.

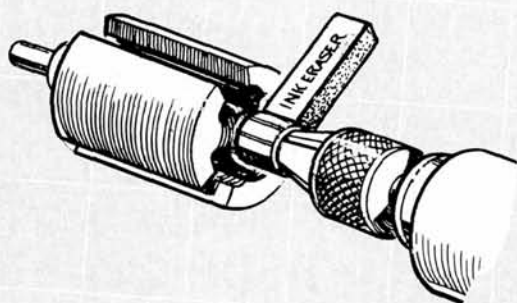
Kevin Randa, McPherson, KS



JR-X2 SERVO ATTACHMENT

This frustrated JR-X2 owner couldn't keep his servo mounted securely, so on each side of it, he drilled a hole through the chassis plate. He then threaded a nylon cable tie through the holes and over and around the servo to solve the problem permanently.

Christian Sauer, Greentown, PA



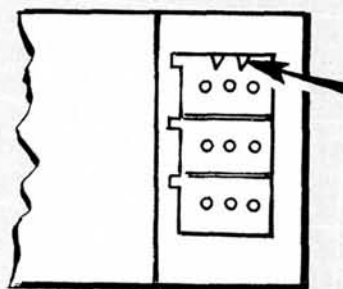
COMMUTATOR CLEANING

To clean your armature with hard and soft erasers, take it out of the motor can, and mount it on the spinning chuck of an electric drill. To avoid putting undue stress on the shaft, slide the commutator right up against the drill chuck.

Henry Cheng, North York, Ontario, Canada

CHALLENGER
W R B

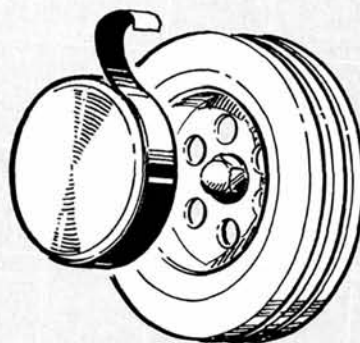
FUTABA
'J'
W R B



NOVAK ESC WITH CHALLENGER RADIO

This is one way to adapt a Novak T-4 for use with a Challenger 2PX. Trim the two tabs, or keyways, out of the receiver with a sharp hobby knife, and then use a Futaba J plug. As shown, keep the colors of the wires the same (W=white; R=red; B=black).

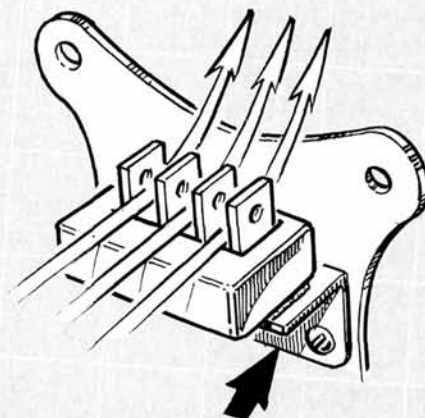
Timothy Marcucci, Grand Island, NY



SHARP-LOOKING HUBCAPS

Clean four baby-food-jar lids, paint them with your favorite color, and wind vinyl electrical tape around their rims until they fit snugly inside your wheels. These clever hubcaps look great, and they'll keep dirt out of your axles and bearings!

Brian Oekel, St. Louis, MO

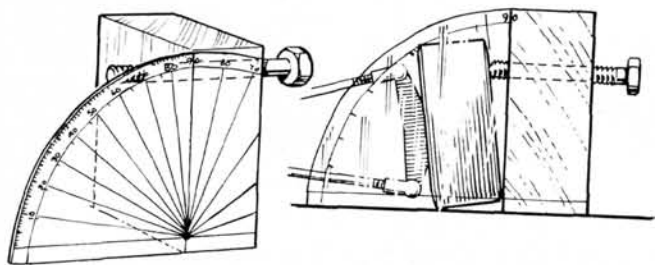


COOLER CONTROLLER

If you have a Novak speed controller in your RC10, you can save space on the chassis and provide the Mosfets with more cooling air. First attach the controller to a piece of angle stock, then mount it high with the heat-sink fins vertical, instead of horizontal.

Jesse Roman, South Windsor, CT

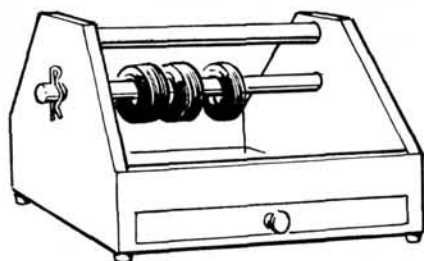
PIT TIPS



CAMBER GAUGE

Drill a hole through a suitable block of wood, and then screw a large machine screw through it. Cut a protractor as shown, and glue it to the side of the block. Now, you can set the camber on one side of your car, read the angle, and then set the wheel on the opposite side to exactly the same number of degrees! Be careful when you tighten the machine screw: it should only just touch the tire.

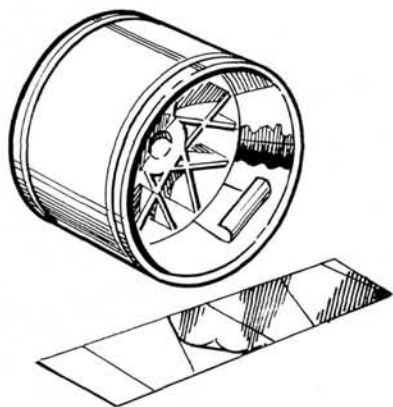
Stanley Chan, Braddell Hill, Singapore



TIRE CADDY

Here's a neat, convenient way to store spare tires in your pit kit. Drill a hole through both ends of the toolbox, thread a large dowel through them, and hold it on each side with body clips. If the dowel is too large for regular clips, you can easily make new ones from large paper clips or coat-hanger wire.

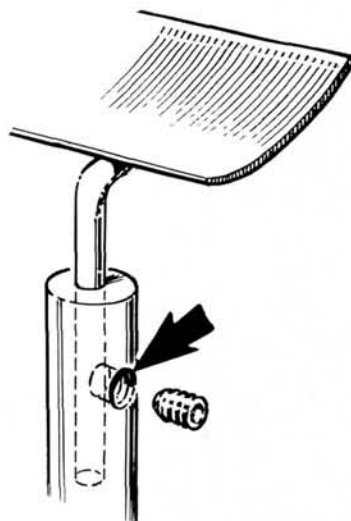
Sean Webber and Matt Guyer, Palo, IA



HOMEMADE CHROMES

Cut a sheet of chrome-colored MonoKote into strips, and then into pie-shaped pieces that will fit inside your wheel rims. Voilà—neat, inexpensive chrome rims!

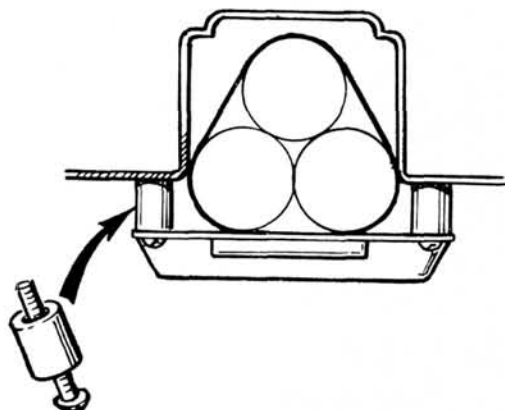
M. Taylor, Painesville, OH



TURBO ULTIMA WING FIX

Here's a simple solution to the problem of straying Ultima wings: drill a $\frac{1}{16}$ -inch hole through the sides of the wing posts, then use spare pinion setscrews to clamp the wing wire into place.

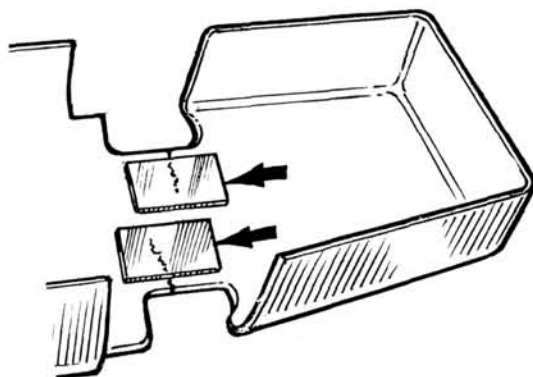
John Schaper, St. Louis, MO



PARMA 8-CELL-PLUS BRUTE

The Big Brute is made for flat packs, but if you cut wooden or plastic dowels into $\frac{3}{4}$ -inch lengths, drill through them and use longer screws, you can lower the battery tray and make enough room for a Parma 8-cell pack.

Bob Chamberlain, Galena, IL



JR-X2 BODY REPAIR

When the rear end of his body shell threatened to break off after some hard racing, this JR-X2 owner glued patches of scrap polycarbonate across the cracks. You can also do this to brand-new bodies before fitting them onto your car.

Louis S. Goltermann III, St. Louis, MO

KYOSHO

PORSCHE



911

by STEVE POND



PHOTOS BY STEVE POND



RADIO-CONTROL CAR enthusiasts have as many preferences as Baskin Robbins has flavors of ice cream. Some like competitive off-road or on-road racing; others prefer car-crushing with their monster trucks; and many more enjoy running their cars or trucks just for fun. Whatever the preference, R/C has something for everyone—almost.

One area that R/C car manufacturers haven't seriously addressed is scale appearance. Although there are cars that closely resemble their full-scale counterparts, they're usually "toy-grade" (with few available replacement parts) or expensive high-performance cars with "almost-scale" bodies. Those with fiberglass slab chassis offer so little in the way of "driveability" and modification potential that they aren't worth the effort.

I'm sure it took Baskin Robbins time to satisfy its customers' tastes (31 flavors probably cover all the bases!). Well, Kyosho has a new "flavor" for the R/C world, and it will appeal to scale-car enthusiasts!

fahnenmühen!
fuhr vor gnuken!



SCALE-CAR KITS

Kyosho's Scale Car Series R/C cars aren't the world's fastest, nor do they have three-function controllers (you know, forward, stop and reverse), but they *do* have durable chassis and plenty of available replacement and modification parts. Their bodies are molded of durable, vacu-formed polycarbonate plastic, and their finer details are sculpted of injection-molded plastic.

The Porsche 911 Turbo Flatnose (which should be referred to as a Porsche 935) has an Ultima II chassis. Based on the Off-Road World Championship Ultima, the Ultima II has been refined, and this makes it more dependable and affordable. Its design features include oil-filled, coil-over shocks on a four-wheel independent suspension, an injection-molded Kelron chassis, an accurately molded polycarbonate body, and realistic tires and wheels. Many of the key parts are molded of a strong, inexpensive material that keeps the kit affordable. These kits are designed to give new enthusiasts a budget-price car that can easily be modified for a variety of applications.

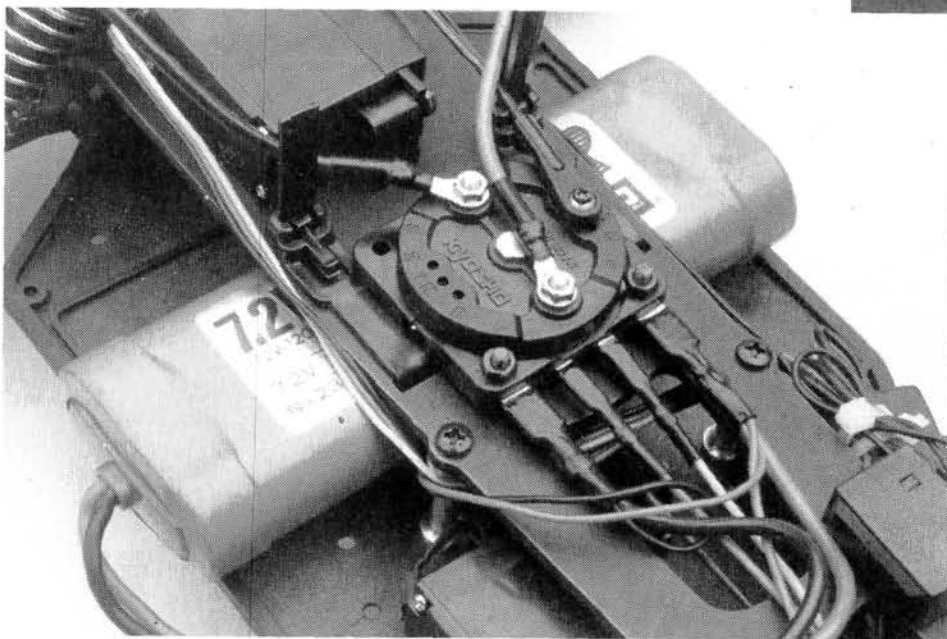
ASSEMBLY

This easy-to-assemble car is perfect for entry-level enthusiasts who can follow instructions. The assembly steps are accompanied by clear drawings that show how the parts are supposed to fit, so it's hard to make mistakes.

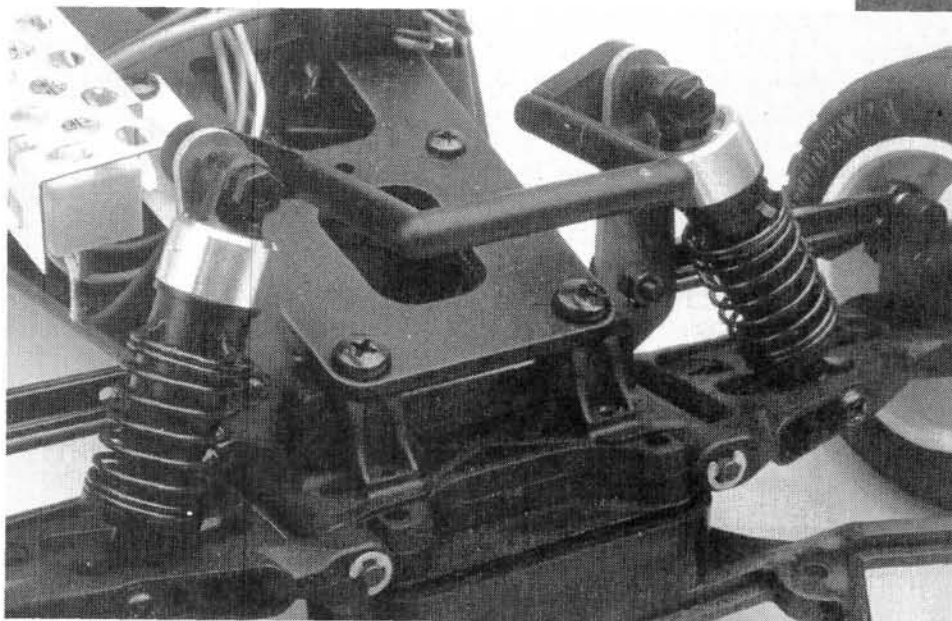
The shock absorbers, which are standard equipment on the off-road Ultima II, are assembled first. Because full-size Porsches aren't designed to handle large bumps, the shock travel in the R/C version was minimized to prevent it from looking like a car crusher. The included spacers limit the travel in the front and rear shocks. To bring the front shocks down to where the car actually sits, I had to add more spacers (simple, 3mm washers) to the front shocks, and this made it even more difficult to install the springs and retainers. Because of the additional spacers, I also had to trim off the bottom of the spring retainer so it

would fit between the shock body and the spacers on the shock shaft.

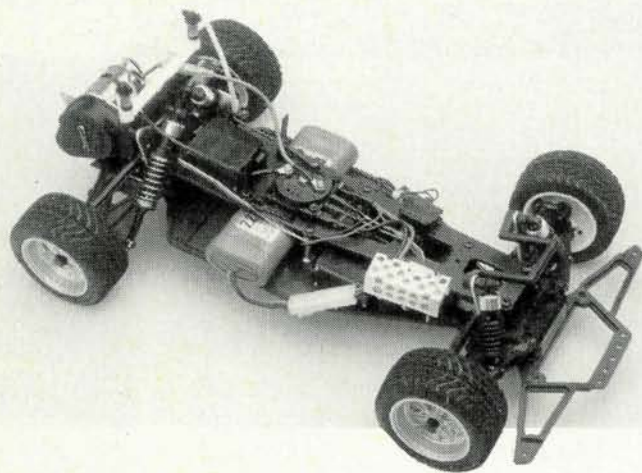
The rest of the instructions discuss chassis assembly (starting with the transmission and rear suspension, followed by the front suspension) and radio installation.



Kyosho's heavy-duty speed controller gets the job done! It regulates the power from the 6-cell battery pack.



Kyosho's inexpensive, reliable, black composite shocks provide front-end damping. The front end of the body is held on by the bar that bridges the front shocks.



Based on the Ultima II, the Porsche has lowered suspension, street tires and rims that are replicas of the ones Porsche actually uses. There's plenty of room for the radio gear. Note the unique rear body mounts—no pins required!

RADIO RECOMMENDATION

You'll need a 2-channel radio system. For the test drive, I used Kyosho's Pulsar 2001 pistol-grip system. (The kit's instructions outline installation of this system, so it's the perfect choice for those who aren't confident about their radio-installation abilities. Other systems will work, but the components might have slightly different dimensions and would require more assembly skills.) The Pulsar isn't a competition-class radio but, for casual use, it's an economical system that's suitable for a car like the Porsche. The transmitter has enough features to make trimming and routine adjustment a breeze.

BETTER BATTERIES?

To get the Porsche on the road, you'll also need a 6-cell battery pack and a battery charger. For the cars in this Series, you can use the popular 6-cell stick pack (i.e., the cells are installed side by side) or a saddle pack. Saddle-pack cells are arranged in two groups, with three cells on each side of the chassis. The two battery groups are connected with a jumper wire. There's very little difference in performance between stick packs and saddle packs, but stick packs are more convenient. They're much easier to install, and easier to store when your day is over.

When all the components have been installed and the gear has been adjusted, it's time to paint the body.

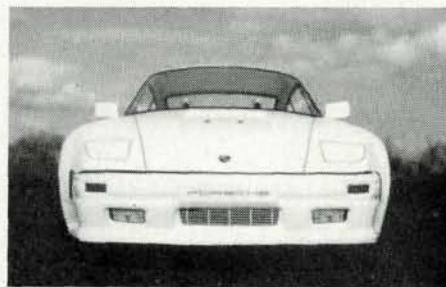
PAINT A PORSCHE

Because the Porsche's body is primarily made of vacuum-formed polycarbonate, you'll have to paint its inside. You must, however, paint the injection-molded plastic details on the outside. Although this is risky (paint runs can ruin a car's appearance) a well-done paint job looks

substantially better than a completely vacu-formed body.

For the body, I used Coverite's* Whizzer White. It's from the line of Body Shop paints, which are specifically designed for polycarbonate bodies. I guess that any paint would work (white is white), but Coverite paints are amazingly resistant to cracking. It might not seem like a big deal now, but it's great when your car comes away from a crash without chipped paint! I painted the outside of the injection-molded details with Testor's* black spray enamel. It dries quickly and provides a bright shine, which adds to the car's overall appearance.

You can use the kit-supplied decals to finish the car. Now, I don't claim to know much about the details on the various Porsche models, but I know enough to say that this kit's decals aren't consistent with the model of the car. The graphics for the kick panels and the front windshield are from an early Carrera Porsche; the 935 was



introduced later. For this reason, I used only the basic detailing decals.

When the body is finished, it's mounted on the chassis using some

(Continued on page 80)

PORSCHE 911 TURBO FLATNOSE

Type On-road
Scale 1/10
Sug. Retail Price \$199.95

DIMENSIONS:

Overall Length 21 inches
Width 9.75 inches
Wheelbase 10.75 inches
Track (f/r) 8 inches

WEIGHT:

Gross (with battery) 3 pounds, 10 ounces

BODY:

Type Porsche 911 Turbo Flatnose (935)
Material Polycarbonate

CHASSIS:

Type Upper and lower plate
Material Kelron

DRIVE TRAIN:

Primary Pinion/spur
Transmission Gear
Differential Bevel gear
Bearings/Bushings Metal bushings

SUSPENSION:

Type (f/r) Independent A-arm
Damping (f/r) Oil-filled, coil-over shocks

WHEELS:

Type (f/r) One-piece plastic
Dimensions (DxW) (f/r) 1.9x1.25 inches

TIRES:

Front/Rear Bridgestone Potenza

ELECTRICS:

Motor Kyosho 05 Stock
Battery Kyosho SCR*
Speed Controller 3 forward speeds, 1 reverse

OPTIONS AS TESTED:

Kyosho Pulsar 2001, ball bearings, SCR 1200mAh battery pack.

COMMENTS:

For a scale replica, the Kyosho 911 Porsche is one of the best values! It's based on the Ultima's time-proven design for which there are a wide variety of available factory and after-market performance parts. With very little investment, you can convert this car to a stock or sport-class off-road car or spend slightly more to set it up for full-blown modified racing.

* not included

Second
SERIES

FROM
KYOSHO



OPTIMA

MID

by T.J. LYN

FOR SOME TIME now, the Kyosho Optima has been proving that it's a world-class competitor. Four-wheel drive



off-road racing is very competitive, and manufacturers hope to improve their results by designing one of the best 4WD machines. In 1987, at the IFMAR World's in England, the Kyosho* team showed up with the Optima as expected, but something was different about the Optima at this event. The

prototype Optima finished second and also captured five of the top ten places—not bad for a prototype! The new Optima gave the world's best a strong run for their money, but the best was yet to come. The Optima Mid is now available for all, unlike some of the other performance machines we've heard about but can't buy for ourselves. This is the 4WD winner that the world has been

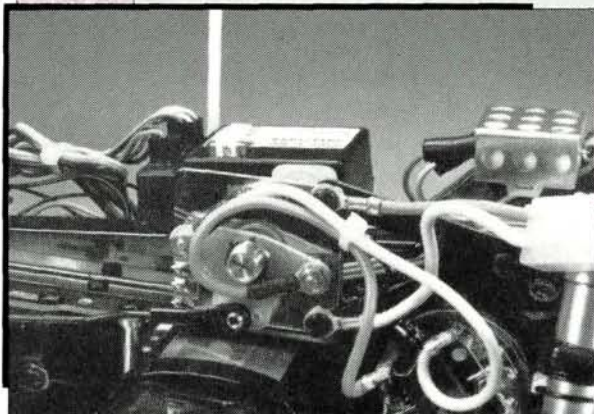
waiting for. With the Optima Mid, Kyosho has improved on the Optima's design by mounting the motor mid ship for optimum weight distribution and handling in all types of off-road conditions. The power delivery system has also been improved by incorporating a strong belt-drive assembly which is metal-reinforced and will resist the stretching and breaking often encountered by chain-drive systems. The latest research and racing results prove that belt-driven systems are much more efficient than traditional chain drives.

The design and layout of the Kyosho Optima Mid are clean and simple. The base is an alloy aluminum chassis pan that is surprisingly light and an FRP (fiber glass

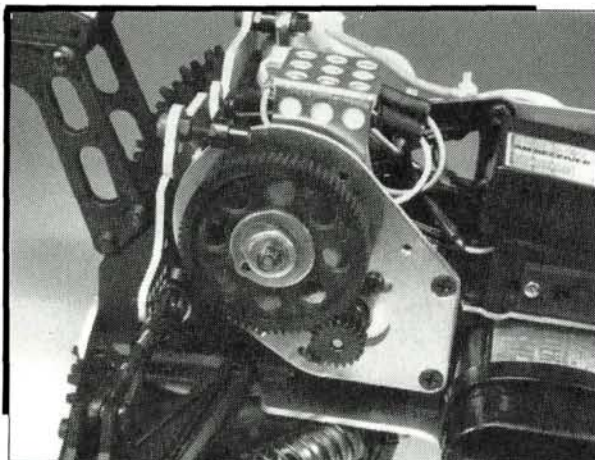
OPTIMA MID



Whether 2WD or 4WD, if you look at the winning cars of past and present, all have simple, uncluttered designs. The Optima Mid is a study in simplicity.



The contact plate and resistor-type speed controller is prone to problems if not kept clean. Parma or BoLink wiper-type unit would be preferable.



A pinion-and-spur gear is the extent of the gear system in the Optima Mid. Supremely simple...but oops!...there's that resistor unit again.

reinforced plate) upper chassis plate. With this combination, the Mid should be able to take on the very worst conditions and still emerge as a winner. The belt-drive system on the new Optima is fully enclosed with a Lexan shield. This increases the work if the belt needs to be checked. However, if, as the manufacturer contends, the belt doesn't stretch or break, then the enclosure is only going to prevent dust and dirt from getting into the system, and this will make maintenance a snap.

The suspension geometry of the Optima Mid is also different from that of the original design. New, special-formula, nylon suspension featuring extra-long, double wishbones for great wheel travel and ride were incorporated with a race-proven set of Kyosho gold shocks as standard equipment. The four differential bearings are standard. Optional equipment includes a set of low-profile, pin-spiked tires and wheels, a set of 48-pitch gears, the hot, LeMans 240ST motor, and a fully adjustable aerodynamic rear wing. All you have to add is your favorite 2-channel radio system and a battery pack and you'll be ready for the winning performances that many world-class competitors are going to experience with the Optima Mid in 1988.

The belt-drive assembly is very simple, and one of the most efficient power transfer systems ever seen in a mass-produced car. It's not only very efficient, but is also the least noisy 4WD as well. It really hums: the noise

Second LOOK SERIES

OPTIMA MID UPDATE

WHEN THE Optima Mid was first introduced in the U.S. (in 1988), it had already made a name for itself in Japan. The following year, Kyosho outdid itself with the Turbo Optima Mid SE. The original gear differentials

had been replaced by a set of ball diffs, and this improved the SE's handling immensely. Kyosho had also added a set of platinum shocks and front and rear anti-sway bars. The anti-sway bars improved handling, but the adjustable shocks performed poorly. Most found that the original Gold shocks performed better.

Included with the SE is a new, three-step, sealed speed controller. A vast improvement over the old one, it keeps dust and moisture off the contacts. With these additions, the SE surpasses the standard Optima Mid in performance and value.

Kyosho seems intent on constantly improving its products. The original Optima Mid was followed by the Turbo, the Turbo Optima Mid, the Mid SE and the Mid CS. (The Mid CS has an extended chassis, and it's available in Japan.) For all I know, there could be more Optimas on the way!

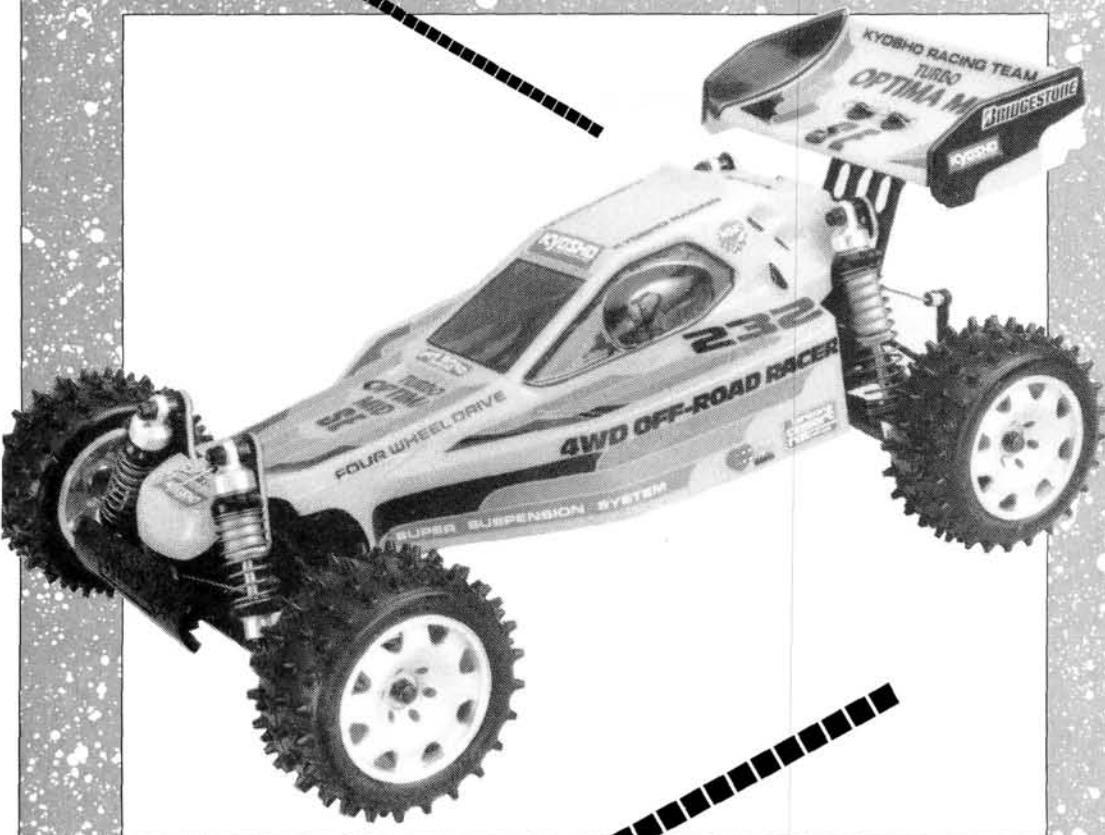
here is from the motor and is unlike the cacophony produced by a drive train in chain systems. With the large-tooth, reinforced belt, the transfer of power from the midship-mounted LeMans powerplant is sure and quick.

Like the Optima and Turbo Optima, space for electronics is tight, but it's used well and provides the best possible weight distribution. Both steering and speed-controller servos are laid out on their sides under the upper chassis plate, and each has its own mounting post, so there are no tie-wraps or double-sided tape to deal with. Held securely in place, the servos can withstand a hard impact without loosening. As for the speed controller itself, the Optima Mid uses the same standard Kyosho plate-controller design as the other high-performance Kyosho cars. The major drawback of the Optima's Mid's controller is that the wiper contacts lift off the base plate, and the arcing that occurs will damage the controller permanently.

The speed controller is mounted vertically instead of horizontally on the left side of the car just in front of the motor. It's only protected by the body, and although its performance won't be hindered by its position, it could be damaged in a broadside collision. Before I race my Optima Mid, I'll replace the mechanical speed controller with an electronic unit.

The only other vulnerable area in the Optima Mid is the front suspension, and this isn't a problem with its design but with its comparative lack of protection. The kit comes with a small piece of nylon composite that will act as a bumper if there's a direct frontal impact, but an

impact to one corner of the front suspension could do some damage. This situation can be easily remedied by adding one of the many wide front bumpers. Buy one in which you can drill your own mounting holes. If the drivers you race against are like some of the drivers I've



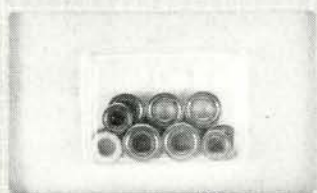
KYOSHO**Precision Ball-Bearings**

A complete set for your Optima/Javelin

Size: 5 x 10 x 4mm (10 Pieces)
4 x 8 x 3mm (2 Pieces w/Spacer)

Stock #KYOC2196

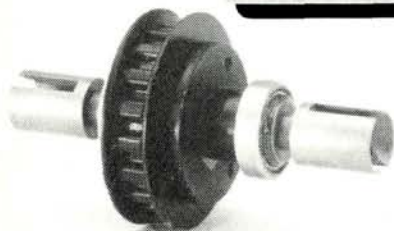
H-001



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MADE IN JAPAN

Kyosho offers a complete set of precision ball bearings for the Optima.

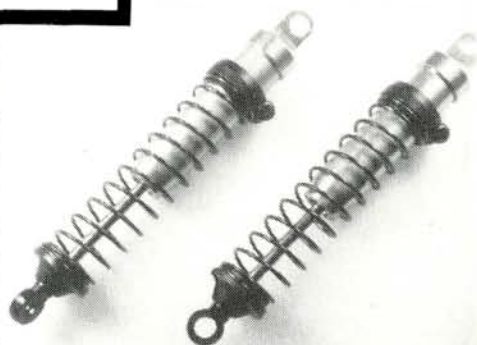


For awesome handling on any surface, Kyosho offers a one-way diff that fits the front of any belt-driven Optima, and a ball diff that fits the front and rear.

Kyosho's Option House Platinum shocks allow you to adjust internal damping instantly simply by turning the ball end.

OPTIMA MID BUYERS' GUIDE

Designed for the Optima and Ultima Series cars, Kyosho's servo-saver reduces steering slop and provides a more precise steering response.



encountered, you'll need a wide bumper to increase your chances of survival!

Acceleration coming out of the turns is a real experience in off-road driving. The LeMans 240ST provides the Mid with a strong, 4-minute run. With improved weight distribution, the Optima Mid is much more capable of taking on jumps and then getting back on all fours with ease. The quiet performance of the drive train is deceiving. You don't hear the same loud noise that's produced by traditional 4WD systems, so you really don't think

that the car is at top speed when, in fact, it is. Then, suddenly, you're on a corner and you have to back off the throttle to reduce your speed.

With the performance of the Optima Mid, you'll be riding the crest of a wave—a wave that's sure to be a permanent one in the future of 4WD off-road racing technology.

**Here's the address of the manufacturer featured in this article:
Kyosho/Great Planes, Box 4021, Champaign, IL 61820.*

FAT TRACKS™

**YOUR FRIEND'S WILL FLIP
'CAUSE YOUR CAR WON'T**

**NEW!****U.S.A. PATENTED DUAL WHEELS**

Nothing can take the place of a set of FAT TRACKS Dual Wheels, and experiencing the thrill of ultimate control at top speed without flipping over. FAT TRACKS rims are designed to hold 2, 1/10 scale (1.9-2.0) rear tires on our rear rims, and 2, 1/10 scale front tires on our front rims. Our rims fit all the most popular 1/10 scale on road, off road vehicles. We are the one and only company to sell these patented wheels so ask for FAT TRACKS by name.



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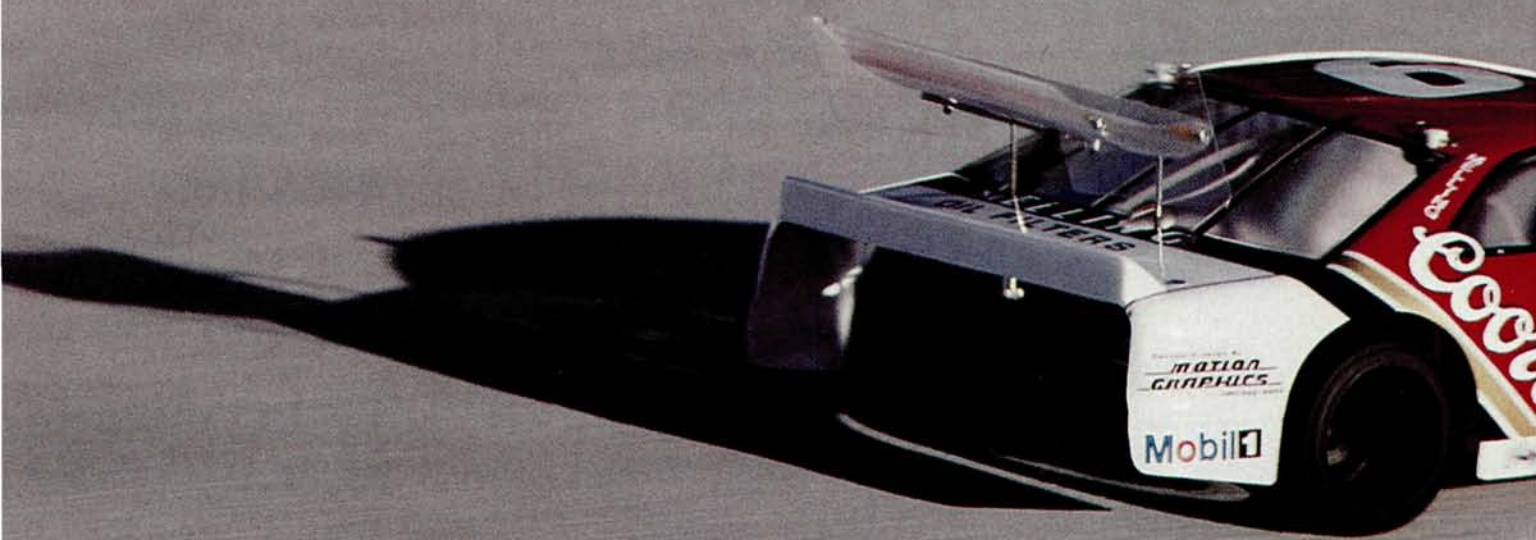
Coming in 1991 — FAT TRACKS will introduce their patented single molded tires. These are exclusive, elite, high performance tires designed for our high performance rims. Tear up the road, not your car. Muscle up with FAT TRACKS. **516-736-1887**
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CONTACT: Michael Sorrentino
John Kidd
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Jacob K. Javits Convention Center
New York City, Feb. 15-18, 1991.

JUNGLE



project LYNN

by STEVE POND

REVER!



PAVED-OVAL RACING ain't what it used to be! Gone are the days when you could take your off-road car out on the oval

and be competitive. Even out-of-the-box pan cars are fading into the background. Highly competitive on-road racers have moved on to the next stage, in which even pan-cars are purpose-built for a variety of track configurations.

The standard pan chassis is considered suitable for most roadcourse racing, but for high-speed oval tracks, many manufacturers are moving toward designs that are more suited to *anything but* a right turn. Moving the batteries to bias the weight to the left of the car is now in vogue.

The CompositeCraft/TRC* Lynx II Elite is one of the latest 1/10-scale on-road cars, and it has quickly established itself as one of the best performers. The car's basic design includes a unique, floating, rear-suspension pod that makes it ideal for bumpy tracks, and its

front suspension is the first to have hardware that's beefy enough to call "1/10-scale." The Lynx II lends itself well to most track designs, but it seems to perform best on ovals.



PARTS LIST

TRC

Offset chassis plate: #5202

T/M radials: #1491 (right front);
#1591 (right rear); #1491L1 (left
front); #1591 (left rear)

Hardened-aluminum pinions:

#648 through #669 (18- through
39-tooth 64-pitch pinions)

**Adjustable caster and cam-
ber magnesium front
crossbar:** #5084

Rear A-arm dampener kit:
#5260

Pro Shock kit: #5460

TECNACRAFT

Titanium linkage kit: #PN17-
06LX

Aerofoil wing kit: # PN 5-12
(5")

TRINITY

6-cell Pushed SCE pack:
#5504

Aluminum wing mounts:
#6008

120-tooth thin spur: #1120

TEAM LOSI

Tungsten-carbide hard balls:
#TL 4015

ANDY'S R/C PRODUCTS

T-Bird body: #3161

BOLINK

Aluminum wing buttons: #BL-
5189

NOVAK ELECTRONICS

**410 MXc electronic speed
controller:** #7120

FUTABA

**PCM 1024 radio system
S9101 servo**

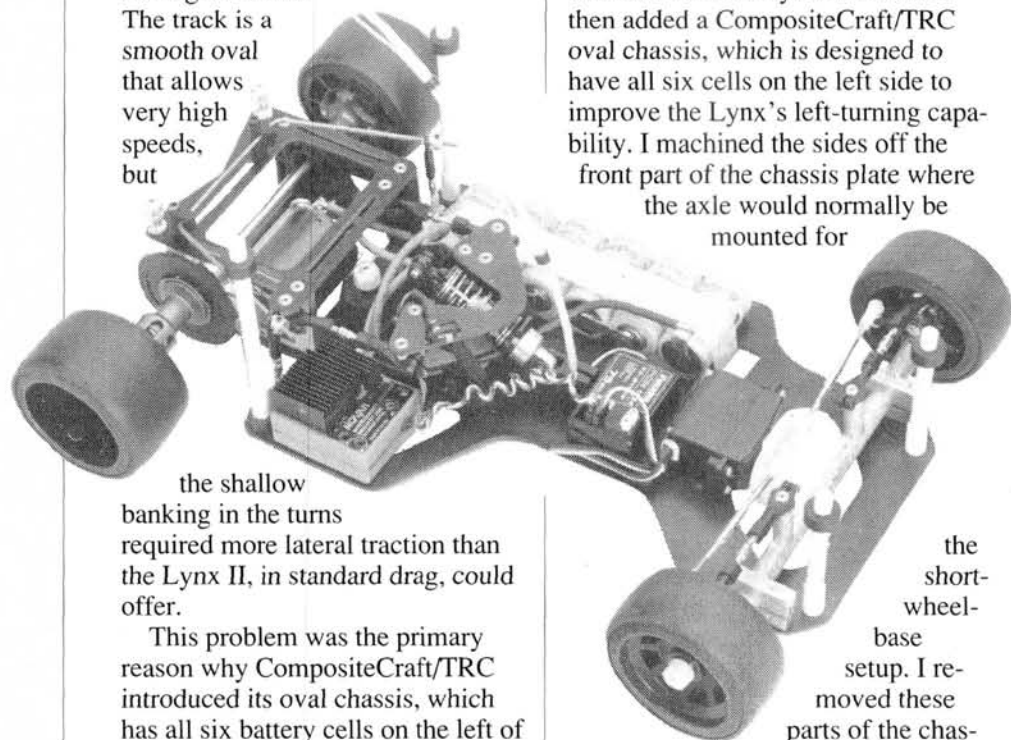
MK ENGINEERING

"Ultra Hubs": #MKL1005 (left
hub); MKL1010 (right hub)

REEDY MODIFIEDS

**Ultra Series Mr. J's modified
motor:** #505

Despite its general prowess on ovals, the Lynx II, with its all-purpose five-and-five chassis, left a little to be desired on certain oval tracks. The first signs of the design's shortcomings came at the 1990 ROAR Oval Nationals at the Peach Bowl Speedway in Georgia. The car handled very well, but it couldn't carry enough speed through the turns and ride the low line as some of the other cars did in the higher ranks. The track is a smooth oval that allows very high speeds, but



the shallow banking in the turns required more lateral traction than the Lynx II, in standard drag, could offer.

This problem was the primary reason why CompositeCraft/TRC introduced its oval chassis, which has all six battery cells on the left of the car and only the electronic speed controller on the right. With many other improvements and modification parts, this is part of the dynamic duo's effort to keep the Lynx II on the cutting edge for those who race at very competitive levels. They've also introduced other after-market parts that further enhance this car's performance. Properly combined, these components can make this sly cat one of the most formidable cars, but a poor choice of components could dial it right off the track. Its owners' abilities to make educated choices will determine how well the car will be set up to handle track conditions—hence, Project Lynx.

With the increasing popularity of oval racing among on-road racers, it was only fitting that I attempt to build the *ultimate* oval Lynx. Most of this country's oval tracks are flat, and based on my observations of the invitational drivers who run the Lynx II, I've compiled what I think is the best combination of components for flat-track oval racing.

FEEDING THE CAT

I started with the Lynx II Elite and then added a CompositeCraft/TRC oval chassis, which is designed to have all six cells on the left side to improve the Lynx's left-turning capability. I machined the sides off the front part of the chassis plate where the axle would normally be mounted for

the short-wheelbase setup. I removed these parts of the chassis because, when the axle is installed in the forward holes for the longer-wheelbase option, the tires are likely to rub against the chassis when the car rounds a tight turn. This isn't much of a problem when you use a wide front axle, but if you change to a narrow axle to reduce steering response, you'll increase the chance that the tires will rub. Moving the axle back to the short-wheelbase position solves this problem, but I prefer to run a long wheelbase for more straight-line stability. This also reduces the weight of the chassis, and to reduce weight even further, I also machined out every alternate battery slot to make three large slots instead of six small

ones. People have been doing this for a long time on dirt-oval cars, and they haven't had problems hold-

because they prevent the scrubbing action of the steering blocks that's usual when the axle is offset to

the rear.) These steering blocks have larger axles, and if you use them, you'll have to replace the existing

Alternate battery slots were cut out of the chassis to reduce weight slightly. Also, the screws were machined flush with the chassis to prevent them catching on anything.

steering rods.

I chose the new Futaba* S 9101 steering servo. This is larger than most of the servos we're used to seeing in on-road cars, but its benefits offset its slightly greater weight. The 9101 centers better than any other Futaba servo. When the steering wheel is returned to neutral, the servo is about as good as they get when it comes to finding the straight-ahead position. It responds quickly, and it's also very strong. The increased torque (more than 40 ounce/inches) means that the 9101 will be more able than smaller, weaker servos to counter the car's resistance to turning when you're racing on a fast, flat oval.

Below, from left to right:

■ The right-side MK Ultra hub is made of lightened 7075 aluminum. A hard-anodized coating increases rigidity even more and produces a virtually bend-proof design. A Reedy Mr. J's Ultra Series provides the horsepower; and a TRC hardened-aluminum pinion and a Trinity "thin" spur gear put the power to the wheels.

■ Trinity Pushed SCE cells provide super horsepower for the Lynx; a Futaba PCM 1024 system guides it.

■ A Novak 410-MXc electronic speed controller provides supersmooth throttle response, and the TRC Pro Shock Kit smooths out the big bumps.

ing their batteries in.

My front axle is one of the latest factory options for the Lynx; it allows both caster and camber adjustment for optimum handling and even tire wear. The axle resembles the car's previous split front end, but a way to adjust camber has been added. Included with the axle kit are 5/32-inch-diameter kingpins and in-line steering blocks, which increase steering response and are less likely to fight the servo when turning. (This is

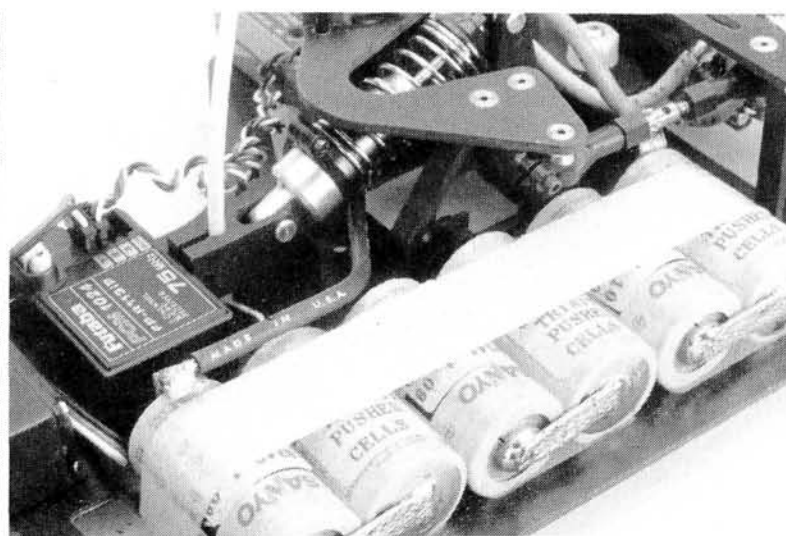
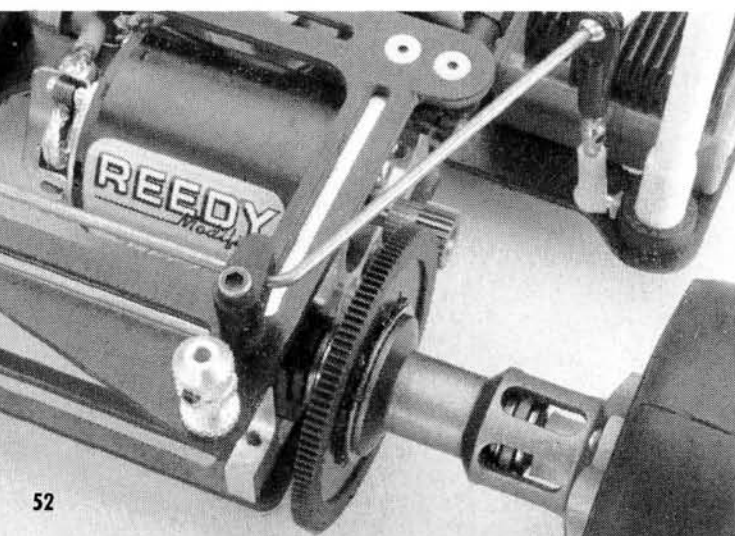
wheel bearings with four 5/32x1/4-inch bearings.

The steering assembly is attached to the steering servo with Tecnacraft's* titanium linkage kit. This complete kit replaces all but the upper links on the optional front end with lighter, stronger rods. The stock linkage rods for the rear pod and for the swaybar are adequate, so if you'd prefer to hold on to your money, you won't need replacements, but I strongly recommend that you replace the kit's weak aluminum

HIND-LEG LOGIC

Rear-suspension modifications started with the link-plate support blocks, which I lightened with a milling machine. I took out some of the excess material in the center of both blocks and then drilled two small holes for the installation of the speed-controller switch in the stock upper link plate.

My next installation was a factory pro shock kit that has a larger, more adjustable shock for rear-pod dampening. Only very



slight modifications are necessary before installing this shock, and the smoother, longer suspension travel is well worth the effort. As a matter of fact, you'll have difficulty finding an invitational driver who runs without one of these shocks (or something like it) in his car.

The pivot point where the pod is attached to the suspension A-arm was also given one of the factory's newest parts. This update includes an additional damper to slow side-to-side suspension motion. Previously, only the swaybar offered any resistance to this motion. The extra damper reduces chassis roll, and this increases cornering stability. This is especially beneficial on a flat track where the car is more likely to roll and suffer sudden oversteer when rounding a turn.

On the top and bottom of the pod, I installed the stock upper and lower graphite plates that I had lightened on a milling machine. I used a lathe to machine the screws that hold the plates to the stock side plates (and I also machined the rest of the car's hardware). I machined the screws on the bottom of the car until they were flush with the bottom of the chassis. I wanted to avoid having any protruding screws that

could catch on a seam in the track or on debris. I also machined the top screws, but this time, just to be consistent (OK, perhaps to save a little weight, too!).

The pod's upper plate is fitted with Trinity* aluminum wing mounts, which replace the stock plastic ones. The stock mounts worked well, but over time, the threads for the screws that hold the wing in place would strip, and the wing could easily fall out. Aluminum mounts are much more durable and will accommodate wing wire of a larger diameter without needing to be drilled out.

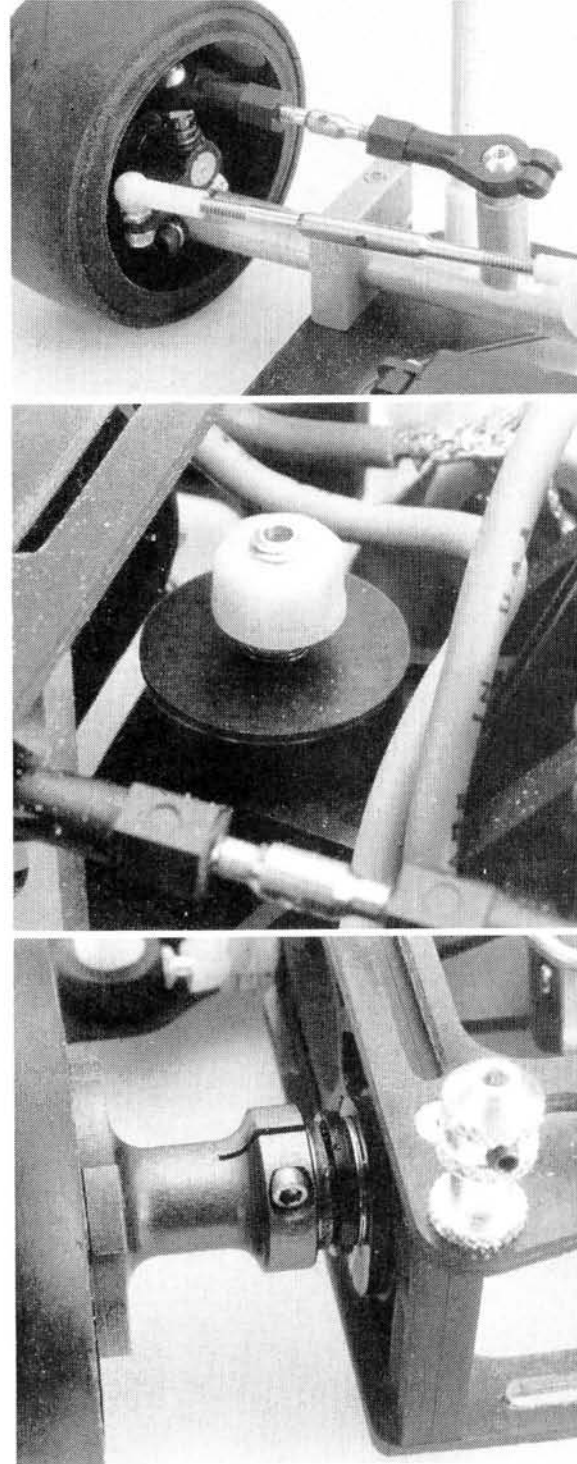
For the rear axle, I substituted a T&A* titanium unit for the stock graphite-and-aluminum axle. This went against everything I had done to lighten the car, because the titanium axle is substantially heavier than the stock one, but I had good reasons. At the speeds reached in oval racing, the stock axle can bend or break (and there's nothing more disappointing than seeing both your rear wheels roll past the car after a collision!). The stronger titanium axle is heavier, but you'll have more peace of mind. To minimize the weight increase, however, I trimmed off the end of the axle that

protrudes from the left side hub. On titanium, this was rather a laborious process, and it isn't essential to the car's performance, but weight is weight!

On both sides of the titanium axle are special Ultra Hubs from MK Engineering* (they'll soon be generally available). The Lynx II's stock hubs rarely run true, and because they're made of 6061 aluminum, they're rather soft and easy to bend. Ultra Hubs are precision-machined of 7075 aluminum, which is substantially stronger. The dimensions of the MK right-side drive hub are similar to those of the stock hub, but it's considerably lighter (it weighs 50 percent less than a stock hub) so it reduces rotating mass.

The weight of the left side hub is also about half the weight of the stock one, and it's attached to the axle in a unique way. The left Ultra Hub is slotted and fits with a pair of opposing 2-56 screws that bind it to the axle so that it's virtually impossible to shake loose. You don't have to file a flat spot on the axle

(Continued on page 80)

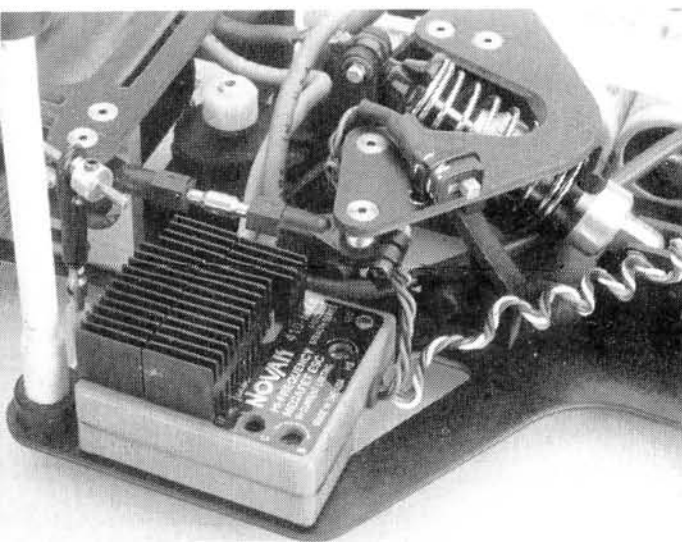


Above, from top to bottom:

■ The use of an adjustable-camber front end eliminates the need for a box of fixed axles, but it increases front-end weight considerably. Tecnacraft titanium linkage is used throughout the car.

■ TRC's rear A-arm damper kit slows the pod's side-to-side motion for more consistent handling through the turns.

■ The left-side MK Ultra Hub is slotted and clamped to the axle, instead of held in place with the standard setscrew. This eliminates the need to file a flat spot on the axle to seat the setscrew (this weakens the axle). Trinity aluminum wing mounts replace the stock plastic ones.





ONE-EIGHTH SCALE, gas-powered, off-road racing has been popular for some time in Europe and Japan, but it hasn't really caught on in this country. Last year, Kyosho USA decided to change that by sponsoring a three-race tour to promote the sport. Champaign, IL, was the final stop in the Kyosho Challenge.

To host the event, Hobbico (Kyosho USA's

parent company and the largest distribution/mail-order house in the U.S.), carved a large off-road track in the front lawn of its massive headquarters. Very smooth and fast, this track was ideal for racing these impressive, nitro-powered speedsters. Although 1/8-scale cars have many of the same sophisticated features as the 1/10-scale off-road electrics we're used to, they're slightly larger, and their 3.5cc engines provide considerably more horsepower!

PHOTOS BY STEVE POND

by STEVE
POND

WORLD CHALLENGE



THE KYOSHO CHALLENGE



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Wichie Ishigami crew from Japan - Tatsuyuki Kadena and Junichi Kane.



8

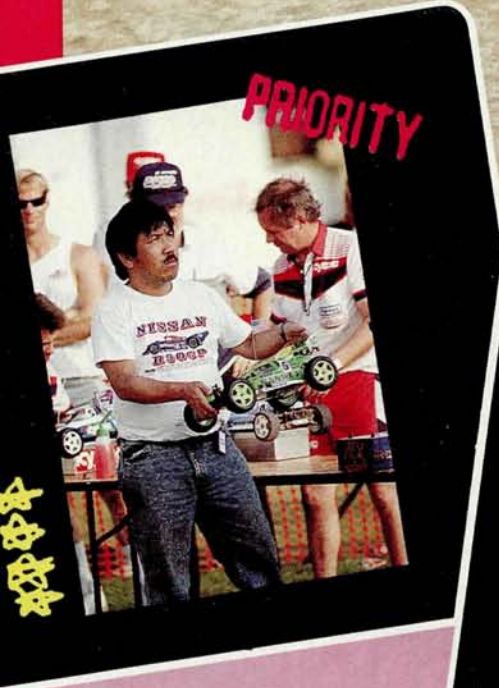
Stewart Wilson picks under the hood. Tony Miller's winning car.

PRETEND YOU'RE THERE!

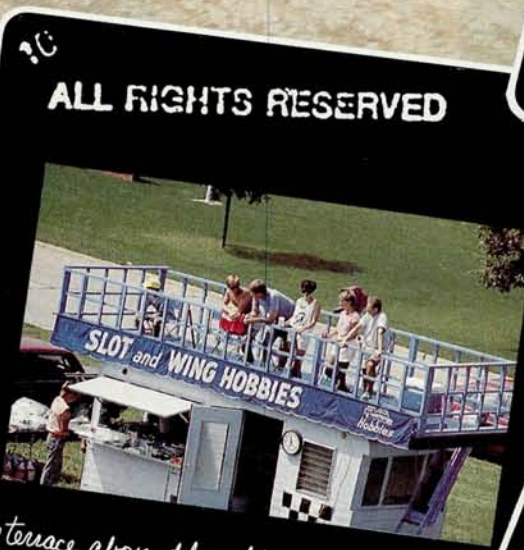
From the starting grid, racers head down a long, high-speed straight-away at more than 40mph. At the end, the track pitches into a 90-degree left turn and then a short chute. Two more quick 90-degree turns put you on a collision course with an aggravating double jump. If you clear the doubles (the shortest way through), you drop into the center of a 90-degree right turn, and a large table-top jump (dubbed Mt. Kyosho!) stares you right in the face.



Kim Potter fires up Mike Burmette's Turbo Buero for the Main.



While you're in the air over the table top, you have to cut the wheel hard to make the 90-degree right turn that lies on the other side. Immediately after that, there's a quick left turn that leads into another sweeping left and back to the front straight.



ALL RIGHTS RESERVED

The terrace above the Slot and Wing Hobbies' trailer was a prime viewing area



The driver's stand.



FINAL STANDINGS KYOSHO WORLD CHALLENGE

A-MAIN • • • • •

- 1 ---- Tony Miller
- 2 ---- Joel Johnson
- 3 ---- Stewart Wilcox
- 4 ---- Mike Burnette
- 5 ---- Frank Calandra
- 6 ---- Yuuichi Kanai
- 7 ---- Katsuyuki Kodama
- 8 ---- Carl Christy

B-MAIN • • • • •

- 1 ---- Ty Dorsey
- 2 ---- Mike Craddock
- 3 ---- Bard Bradbury

C-MAIN • • • • •

- 1 ---- Bud Bartos
- 2 ---- Dean Howard
- 3 ---- Billy Koliopoulos

D-MAIN • • • • •

- 1 ---- David Walford
- 2 ---- Randall England
- 3 ---- Ron Lauter

E-MAIN • • • • •

- 1 ---- Jeffrey Salyer
- 2 ---- Mark Thompson
- 3 ---- Chris Gentile



This track wouldn't be too tough for a 1/10-scale car to negotiate, but it was a challenge for the fast, powerful 1/8-scale cars.

OO, CELEBRITIES!

Talented drivers from around the globe attended the Kyosho World Challenge. From the U.S., there was former 1/10-scale Off-Road World Champion Joel "Magic"



CLASSIFIED

MCMLXXXVIII



FRAGILE



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Yuuichi Kanai flies the stars and stripes as he clears the doubles during the final qualifying round

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Johnson, former 1/12-scale World Champ Bud Bartos, Carl Christy, the "Big Man" Jim Hoffman, Mike Burnette and the "clown prince" of 1/8-scale off-road racing, Bill Koliopoulos. From the U.K. came Tony Miller, Stewart Wilcox and Mike Craddock of the Ripmax/Kyosho team. While their racing accomplishments aren't well-known in the States, lists of the top finishers in Britain's 1/8- and 1/10-scale races are checkered with their names.

Katsuyuki Kodama and Yuuichi Kanai (who finished 2nd at the last 1/8-Scale Off-Road World Championships) came from Japan to represent Team Kyosho, and a host of other talented racers filled out the field of 35. Without a doubt, we had the makings of the series' most competitive race.

GEARING UP

The action began early on Saturday, as

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4 SPECIAL



Flanked by his British teammates totting the heavy hardware, Mike Craddock wonders what happened to his trophy

DINING WITH THE MELTING POT



Joel Johnson celebrates his supposed birthday during the post-race festivities.

Racing in a foreign country not only allows you to compete against international talent, but it also lets you experience a different culture. As members of the host country for Kyosho's World Challenge, we took the foreign drivers out to dinner at Alexander's Steak House in Champaign, IL—the perfect place for them to get a good taste of the ol' red, white and blue.

Alexander's serves a large variety of beef cuts, and there's even a huge charcoal grill where you can cook your own meal. Coming from a country where beef sells for the equivalent of \$100 a pound, the Japanese drivers looked wide-eyed

at the meat locker. They didn't have much experience of cooking beef, either, so as self-proclaimed steak experts, the Americans stepped in to help.

Then, we all sat down at a large table and shared racing stories between mouthfuls. Tales of brilliant wins and devastating losses went back and forth, as did set-up tips for the fastest way around the track. Because we in the U.S. are inexperienced in 1/8-scale off-road racing, we picked the minds of those who have raced the nitro-burners. We learned that tracks in Europe and the Far East are very large and incorpo-

rate a variety of surfaces—even grass! We also learned some key foreign words (racing terminology only, mind you!).

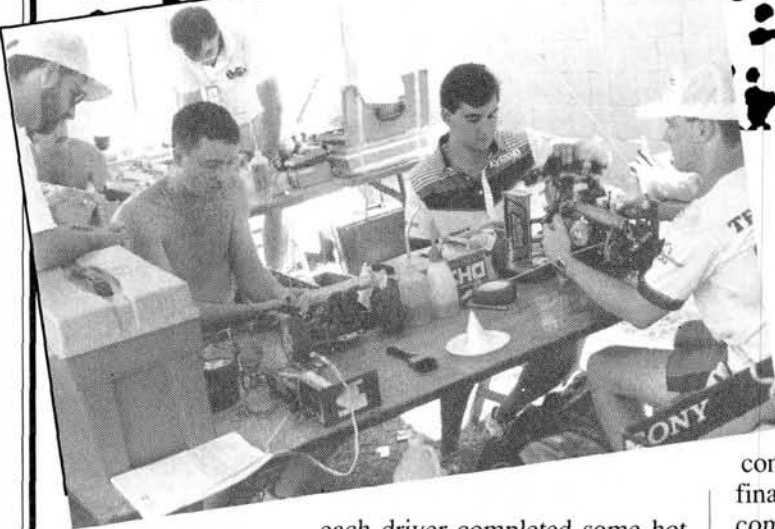
Before the end of our farewell dinner, we convinced the staff to celebrate Joel Johnson's birthday (even though it wasn't the right day!). A string of waiters and waitresses sang a loud "Happy birthday to you" and presented him with a birthday beanie and a cupcake with a single candle. A candid Polaroid shot preserved the moment for life.

We hope these drivers will return next year—and bring others—for more wheel-to-wheel racing and another trip to Alexander's!



Dining with the crew at Alexander's Steak House. The woman near the left of the table was kidnapped from Chi-Chi's by Kyosho strong-arms Tim and Tom; she was later saved by Tony Miller.

ON EIGHTH KYOSHO CHALLENGE



each driver completed some hot test laps in a search for the best chassis/tire combination and the fastest line around the course. During practice, the top layer of the track wore away and was replaced by a hard layer with an obvious "blue groove" in the heavy traffic areas. Instead of constantly grooming the track, which creates ever-changing conditions, officials decided to leave it as it was and let the drivers dial in their cars for the slick surface.

The large-spiked tires that worked well early in the morning gave way to BSW-40s. These new tires were developed by Kyosho for the World Championships, and they have a small, pin-spike tread molded of very soft-compound rubber. To prevent them from collapsing, small strips of foam support their center sections.

A soft suspension with a medium setting of the adjustable center differentials (which are standard equipment on the Turbo Burns) seemed best on this track. Although traction wasn't ideal, the hard, smooth surface allowed some blistering speeds during the final practice runs, and this gave us a taste of what was to come.

GETTIN' GOIN'

Three qualifying rounds on Saturday and one on Sunday seeded the drivers for the Mains. Early on, U.S. drivers Joel Johnson and Mike Burnette (each driving an O.S.-powered Kyosho Turbo Burns) waged their usual war by sticking within a few inches of each other for most of the 10-minute heats. Burnette had engine trouble near the end of each run, and this prevented him from locking up a spot in the A-Main. Johnson set the time to beat at 35 laps. (Most of the field was running in the 34-lap range.)

England's Tony Miller and Stuart Wilcox (who were driving Mondial-powered Kyosho Turbo Burns) turned in some hot runs, but they couldn't beat Johnson's time. Japan's Yuuichi Kanai (with an O.S.-powered Turbo Burns) was also a threat, but even he couldn't knock the Magic one from the top spot. Katsuyuki Kodama couldn't put together a trouble-free run, even though his Rex-powered Turbo Burns looked fast early in qualifying. Even though he had only driven 1/8 scale twice before, Carl Christy turned in a notable run, as did Frank

Calandra, who had *never* driven 1/8-scale off-road. As the sun dropped below the horizon, the drivers fine-tuned their cars for Sunday's final round of qualifying and the Mains. An on-site hobby shop provided by Slot and Wing Hobbies of Champaign, IL, had an ample parts supply. As competitors replaced worn parts and gave their cars a final tweak, the sound of electric screwdrivers and air compressors replaced the high-pitched whine of the nitro-burning engines.

UP, UP AND AWAY?!



The day after the race, drivers had a chance to fly a Kyosho Eclipse.

On the day after the World Challenge, some of the drivers tried their hand at flying. Hobbico provided the aircraft—an electric-powered glider—and Bill Jeric and Tim Lampe gave them a crash course in the basics before handing over the transmitter. The Kyosho Stratus 2000 is rather docile as airplanes go, but it's about all you can handle after only a few minutes of instruction!

Even though it was probably their first time at the sticks of an airplane, the drivers-turned-pilots quickly learned the do's and don'ts of aviation, e.g., *don't* fly the plane into the sun, and *do* keep it more than 50 feet off the ground!

Later, Tim Lampe treated everyone to a demo with a pair of Kyosho Concept 30 fuel-powered helicopters and an EP Concept electric. The EP uses many of the same components as our electric-powered cars, but Tim warned us that an electric plane isn't necessarily easier to fly. None of us was brave enough to take the sticks, and I don't think Tim would have relinquished them—but who knows! Perhaps, next year, we'll chase each other around pylons with helis!



The Kyosho EP Concept was one of the highlights at the airfield. This electric-powered helicopter uses the same batteries and motor as an electric R/C car.

THE NIGHT KYOSHO CHALLENGE

WHAT'S THE WINNING SETUP?

A large tent was set up just behind the drivers' stand for the drivers to use as a pit area. With all the cars and drivers in one place for the first time, racers and spectators got a close look at the competitors.

Although there were a few Pirates and Mugens, the majority were Kyosho Turbo Burns, which were mostly run in out-

of-the-box configuration (although some had interesting modifications). Joel Johnson's car had a graphite chassis and titanium turnbuckles that had been custom-made by Tecnacraft in California. Johnson's engine was a "VooDoo" O.S. EX-B, which had been modified by Team Losi's Gary Kyes.

The British drivers also ran Turbo Burns. Two of the three cars had many of the stock chassis components, but they incorporated a dual-disc-brake system. In this system, one brake assembly is attached to the drive shaft right in front of the center differential; the second (for stopping the rear of the car) is in the usual location.

When you run the center diff loose to improve traction on a slippery track, braking causes a lot of weight to be transferred to the front of the car. With the differential seeking the path of least resistance, the rear wheels lock while there's very little braking of the front end, and this creates heavy oversteer. A dual-brake assembly is superior to a single brake because it allows the drivers to compensate for the loose center diff by dialing-in more front-end braking.

The British had made other interesting design changes. Stewart Wilcox's car had a one-way bearing for the center diff, instead of the standard bevel-gear setup, and all the British cars used Mondial en-

gines instead of the popular O.S.

The two Japanese cars were essentially stock, except for their dual brake systems. These were similar to those used on the English cars, but the brake for the front end was mounted closest to the front differential. Kanai's car was powered by what appeared to be a stock O.S. engine, while Kodama opted for the Rex that has been so popular in 1/8-scale on-road racing.

WHO'LL MAKE THE A-MAIN?

Early on Sunday, race promoter Bill Jeric and announcer John Thawley got the final round of qualifying into gear. This was to be the event's most exciting qualifier, because the drivers who hadn't done well so far realized this was their last chance to get into the big feature—do or die!

Kanai's previous qualifying runs had pretty much guaranteed him a spot in the A-Main, and in the final round, he looked as though he might also knock Johnson from the top of the heap. Despite an almost flawless run, however, he finished .05 second behind Johnson for the second spot on the grid.

Tony Miller and Stewart Wilcox also locked up spots in the Main, as did Kodama, who, after having trouble all weekend, managed to collect himself. Mike Burnette, who had been one of the most consistent A-Main drivers in the previous events, had his share of engine trouble early, but got his act together. Frank Calandra and Bud Bartos filled the other two spots in the eight-car A-Main.

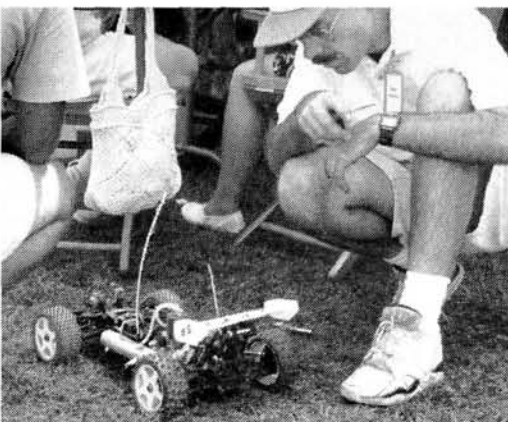
A break after the last round of qualifying gave the drivers a chance to work on their cars and mentally prepare for the "final kill." It also gave the hosts a chance to fire-up the grills for a true, Illinois, sweet-corn fest. (In this part of the country, finding enough corn to feed all the drivers and spectators was no problem!) This was the perfect "appetizer" for the weekend's main event.

Later in the afternoon, we watched the first of the Mains. Less successful drivers started off the program in the E-Main, which lasted 10 minutes. Most of them were new to 1/8-scale off-roading and received help from the more experienced drivers; if nothing else, this made the whole weekend worthwhile. They learned a lot about engine tuning and suspension set-up, and their increased expertise showed every time they set their cars on the track. Those who couldn't even finish their first qualifiers could last for the duration by the time the Mains rolled around.

Jeff Salyer, David Walford and Bud Bartos won the 10-minute E-, D- and C-Mains, respectively. The B-Main lasted 20 minutes, and drivers had to make three or four pit stops for fuel to complete it. A battle was waged between the U.K.'s Mike Craddock and



Above: Yuuichi Kanai gets a taste of fine American cuisine while working on his car in the pits.



Area residents, Hobbico employees and racers from the lower Mains lined the barrier as the world's top drivers prepared to push their cars to the limit.

Ty Dorsey. Because of his experience with 1/8-scale cars, Craddock was considered the favorite, but Dorsey got a good jump from the start. He managed to fend off all charges from Craddock, who came across the line in 2nd ahead of Bard Bradbury.

R/C LEAPFROG!

The A-Main drivers brought out all the "fence hangers" when they fired-up their cars for a brief warm-up before the feature. Area residents, Hobbico employees and racers from the lower Mains all lined the barrier as the world's top drivers prepared to push their cars to the limit.

In a LeMans-style start, Joel Johnson got the jump on Kanai, who was next to him on the starting grid. These two led the field through the first lap of what promised to be the most intense 30 minutes of the weekend. Johnson was in first for a while, but then he made a slight driving error in the transition from the doubles to the table top, and this allowed Kanai to sneak by him on the inside. Kanai coasted over the table-top jump and throttled down the backside, and his calculated driving style helped him to stretch his lead over the rest of the pack.

It didn't look as though anyone would be able to challenge Kanai, but when it was time for a pit stop, he took longer than usual to fuel, and the field closed the gap. Johnson managed to squeeze by Kanai for a second chance at the lead, but Kanai came right back a few laps later. Kanai again extended his lead—this time beyond the reach of Johnson and Miller, who were battling for 2nd place.

Then Kanai came up on slower traffic; he collided with one of the cars and broke his left shock-absorber shaft. This ended his bid for the checkered flag; all he could do was limp around the track and hope to finish the race. Johnson quickly passed him and charged ahead for the win.

About two-thirds of the way through the Main, however, Johnson was called into the pit when the 6-minute ticker told his crew it was time for a splash of fuel. Just after clearing the double jumps, Johnson's car turned over. If it had still been running when the marshall reached it, Johnson would have remained in the lead, but because the fuel was so low and the car was upside-down, the engine quickly flamed out.

Miller, who had been in 2nd, managed to put Johnson two laps down before his car was restarted and back on the track. Johnson made a hard charge and managed to pass Miller twice to get back on the lead lap, but when the timer expired, Miller had managed to hold on for the win!

THE END

The engines were silenced as quickly as they had come to life, and a great weekend of racing came to an end. When the dust had settled, Tony Miller was crowned the winner of the first Kyosho 1/8-scale Off-road World Challenge.

Thanks to Clive Coote (Mr. Ripmax) and Ray Wilcox for bringing their team over from the U.K.; to Junichi Ishigami (of Super Machine Magazine and Kyosho Japan) for bringing his drivers; and to all the other competitors for making this a spectacular event. Bill Jeric and the rest of the Kyosho Team here in the U.S. also deserve a tip of the hat for hosting this great, "fun" event.

Bill plans to launch *this* season with a race at Georgia's ARCAR facility and to host another World Challenge, and we hope other teams from around the world will compete for the title. If this year's race sparked your interest, you won't want to miss the next one! ■

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HOT TRACKS

Here's another in our "Hot Tracks" series of outstanding R/C race courses. To see your favorite track featured here, send us good black-and-white photos and a description of its delights! (approximately 500 words). Send your entries to Hot Tracks, Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



QUINTRAX SPEEDWAY BELLEVILLE, ONTARIO, CANADA

THE QUINTE AREA of southern Ontario, Canada, has always been a center for full-size motor sports. Stock-car drivers from northern New York and southern Ontario compete regularly at the area's speedways and, throughout the year, top drivers from Canada's Rothman Porsche Challenge and the Players Challenge racing series meet at the Shannonville Motorsports roadcourse.

For R/C cars, there's the Quintrax Speedway. Located in Belleville, Quintrax is one of Canada's largest indoor R/C car tracks. Retired stock-car driver Danny Reid owns and operates the track and hobby shop with help from his wife, Sandy, and their two children, Scott and Wendy.

Quintrax has an indoor clay track that can accommodate 1/10-scale off-road racing and oval racing. The track has more than 100 active members, including drivers from Toronto and Montreal who travel 150 to 250 miles on the second weekend of each month for races. (A few of the Toronto drivers venture out for weekly competitions, too!)

On June 30 to July 2, Quintrax hosted the 1990 Canadian Nationals, which drew Canadian competitors from as far away as Newfoundland and British Columbia and American competitors from California (including Team Losi's Jack Johnson and Gil Losi Jr.). With 525 participants (265 2WD cars, 180 4WD cars and 80 trucks), this was probably the largest event ever held in Canada.

Quintrax will also host the 1991 Winter Nationals (January 26 and 27) and the 1991 Canadian Open (June 29 to July 1). Oval racing is becoming increasingly popular at the track, and there will be a \$1,000 cash purse up for grabs in the Eastern Ontario Oval Championships.

The track and the large hobby shop are open seven days a week, league racing is held on Tuesday and Thursday nights, and major races are held on the second weekend of each month. In the summer, there's an outdoor track which, with its 150-foot straightaway, can accommodate gas-car racing—even the turbo-burners!

For more information, contact Sandy Reid, Box 1034, Belleville, Ontario, Canada K8N 5B6. Tel.: 1-613-962-1414; FAX: 1-613-962-7306.

HOW TO make a winning CONCOURS INTERIOR

by JOHN HUBER



The driver's visor is made of a thin piece of plastic that I screwed to the helmet with 4-40 round-head hex bolts. (The driver was originally from a Tamiya car.) The cool suit and radio lines are of standard electrical wire.

WHAT DOES IT TAKE to win concours? Obviously, you need a finely detailed, well-painted car, but what can you do to make your car *really* stand out?

Last year, I planned to enter an '89 Toyota in an upcoming event. I spent countless hours painting the body and searching for the appropriate decals, but it still lacked something.

The car definitely needed a more detailed cockpit, including a driver. I realized, however, that if I made a detailed interior, I also had to find a way to bring the judges to their knees (so to speak!) to see what I had done.

First, using a piece of Lexan, I made a platform that could serve as a driver mount (and hide the chassis!), and I

painted the top of it with flat black paint to create the illusion of depth. I gave the driver cool-suit hoses and a visor, but he still didn't look right—what was missing? Suddenly, I realized that he didn't have a shifter or a dashboard! I searched my room for anything that I could fashion into useful cockpit accessories.

The Associated Toyota 89HF GTP body is very sleek and realistic. I made the rear wing of scrap polycarbonate and mounted it to the body using foam tape.



SUDDEN SHIFT!

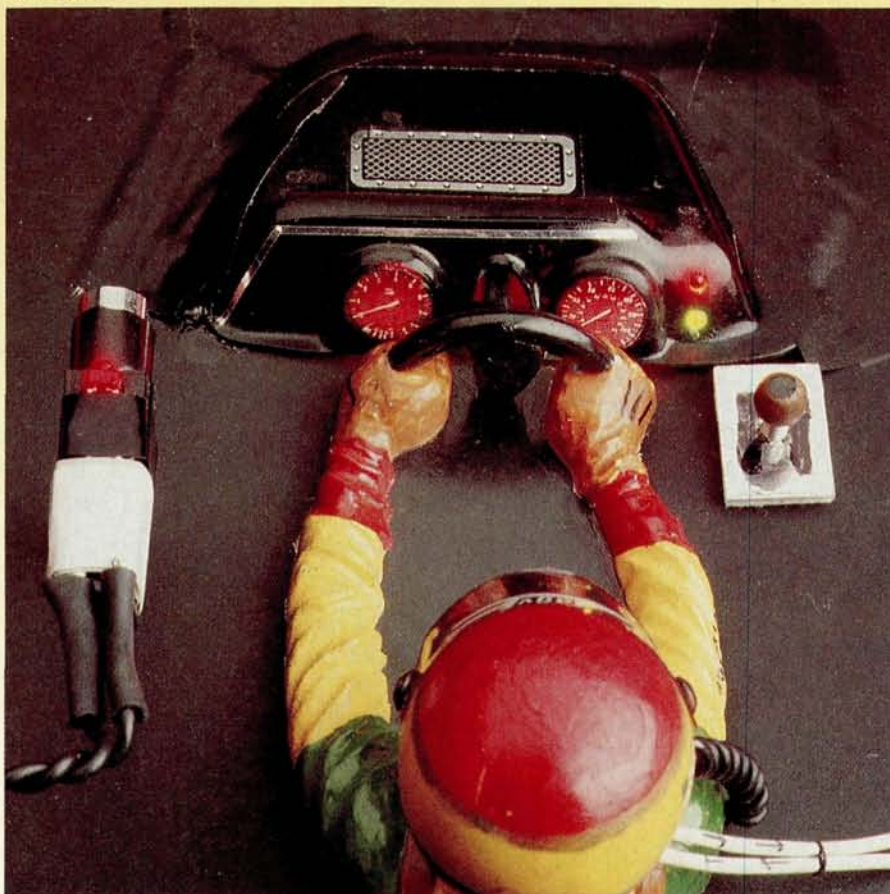
For the shift gate, I applied some chrome decals to a small piece of Lexan. I drew a shift pattern on it with a black marker and, at the appropriate place, I drilled a hole through which the shifter could pass.

To make the shifter, I ap-

plied a small amount of formable epoxy (for the knob) to the top of a stainless-steel 4-40 hex screw. (Because this epoxy sticks to both metal and plastic, it's great for any creative application! It comes in two parts—one is blue and the other is yellow. Simply mix

equal amounts of both colors, and the mixture becomes rock hard overnight.) When the epoxy had cured, I painted the knob brown to simulate wood, and then I mounted the entire assembly in the cockpit.

The dials on the dash were cut out of a motorcycle magazine. When the light system is turned on, the dash looks real.



PHOTOS BY JOHN HUBER & YAMIL SUED

get real!



HOW TO make a winning CONCOURS INTERIOR

A "DASHING" IDEA?

The car was almost finished, but the dashboard was still missing. I went back to the mess that I call my room and searched some more. Finally, I found an RC10 driver that had the perfect dashboard attached to it. I trimmed the dash away from the driver and put it into my new car.

The dashboard needed gauges, too, so I went to my stack of motorcycle magazines. Soon, I found a clear photo of some motorcycle gauges. I cut them out and glued them to the dash with a drop of CA. I painted the inside of the dash black, leaving the area behind the gauges clear so that I could put lights and indicator lamps behind them.

LIGHTS, CAMERA...

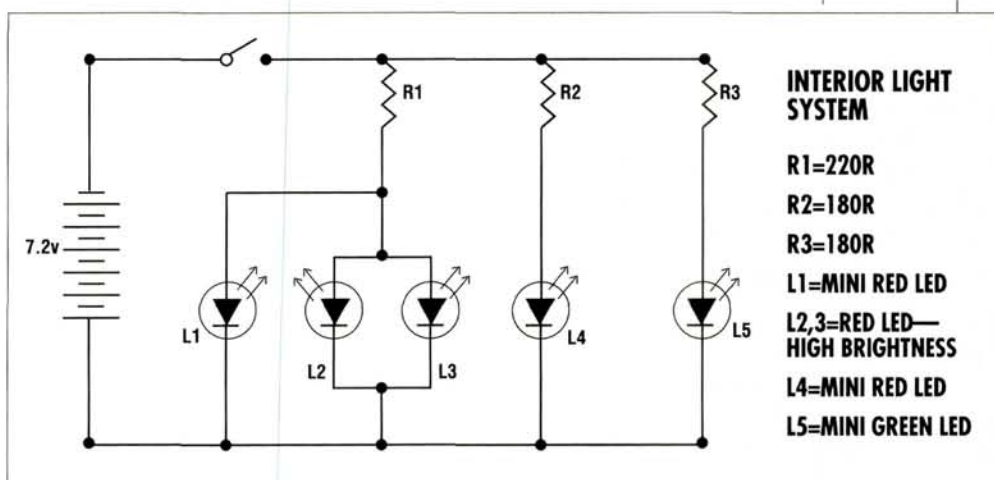
Because I had to experiment with various resistor values, it wasn't easy to rig the lights and lamps. I wanted to use large LEDs for the lights and small red and green ones for the indicators, but they had different electrical properties, so they weren't equally bright when connected to the battery. After a lot of trial and error, I finally found the correct resistor values for this application.

Although the car had a lot of details, I still had to make it stand out from a distance. I remembered that many full-size race cars have video cameras mounted inside their cockpits to

film the action on the road. For the "cherry on top of the sundae," I decided to add a miniature model video camera to the inside of my R/C race car!

I used a Sermos* connector for the camera body and an LED panel mount for the lens. Be-

someone had left his car on (or so he thought when he saw the red light!). When I explained that the light was for a video camera, he closely examined the car. My strategy worked—I got a judge to look at my car's interior details!



cause I wanted to add a tiny red LED to the top of the camera, I had to correct the resistor values for *all* the lights again. Other than that, the camera was easy to make and very realistic. I was really excited about showing off my latest creation!

ACTION!

The event that I had entered was large, so there were a lot of cars competing in concours. When they were called to the judging area, I started to bite my nails.

Soon, a judge announced that

The competition was stiff, and the suspense nearly drove me mad. I ended up in 2nd place (there was a finely airbrushed car in the competition that deserved to win), but I was happy with the results. I went home with a great trophy and a big smile.

The next time you're preparing to enter a concours, why not try some of these ideas? They might just make you victorious!

**Here's the address of the company mentioned in this article:*
Sermos R/C Snap Connectors, Cedar Corner Stn., P.O. Box, 16787, Stamford, CT 06905. ■



SCHUMACHER

CAT

by STEVE POND

RADIO-CONTROL RACERS are a tough group to impress. For a new car to gain recognition as a competitive machine, it has to have some pretty impressive wins, or at least be the car of choice for a topnotch driver.

When Schumacher Racing* introduced its 4WD Cat, it was received with limited enthusiasm, and its unusual design features kept many racers from buying it. It wasn't until Masami Hirosaka won the 4WD class with his Schumacher Cat at the

'87 World Championships in Romsey, England, that the Cat started to attract attention. Schumacher has since introduced two new versions of the now famous Cat, and the Pro Cat is the most recent.

Released last year, the Top Cat was Schumacher's first competitive 2WD car, and it experienced the same lukewarm reception because of the radical design features. The Top Cat was the first 2WD that had a belt-drive transmission, but it was the front-



BRITISH



INVASION

AR



end design that kept many racers at a distance. The suspension was centered around a lay-down front shock design that used levers and pivots to actuate the shocks. Had the suspension functioned properly, the Top Cat would have been a pretty tough customer, but this design was too far advanced to implement with materials that would keep the car in a competitive price range.

COUGAR

Enter the Cougar—a simplified version of the Top Cat that has a de-tuned front suspension that looks promising. The Cougar still uses the belt-drive ball differential, aluminum chassis plate and oil-filled, coil-over shocks. Now the front suspension has the standard upright shock mount and the ever-popular lower-A-arm/adjustable-upper-link setup that's used on most 2WD cars.

There is, however, an added bonus to the new front suspension that Cecil Schumacher couldn't resist throwing in.

The front end is essentially adjustable for rake angle, while on most other cars, it's fixed on the chassis. By placing spacers behind the front shock tower during installation or at the track, the rake angle can be set at 15, 20, or 25 degrees, depending on the track conditions!

The features of the belt-drive transmission include a differential with a 14-ball design between the diff rings, instead of the standard eight that are on most cars. This distrib-

utes the load on the rings more evenly and results in a smoother operation and less wear. To make trackside changes a breeze, there's also a quick-change setup for the 48 D.P. spur gear. A high-torque, Kevlar drive belt that connects the spur gear to the differential is relatively easy to adjust for tension, and it can only come out of adjustment if the belt stretches.

Other features include a pair of universal-joint drive shafts (made popular on the JR-X2, but originally used on the Schumacher cars), turnbuckle linkage for quick and easy adjustments, and a rack-type steering assembly for more precise control of Ackerman steering. Also included in the kit is a complete set of Oilite bushings, which I can only assume is intended to keep the cost down, but if you're serious about racing, do what I did: pick up

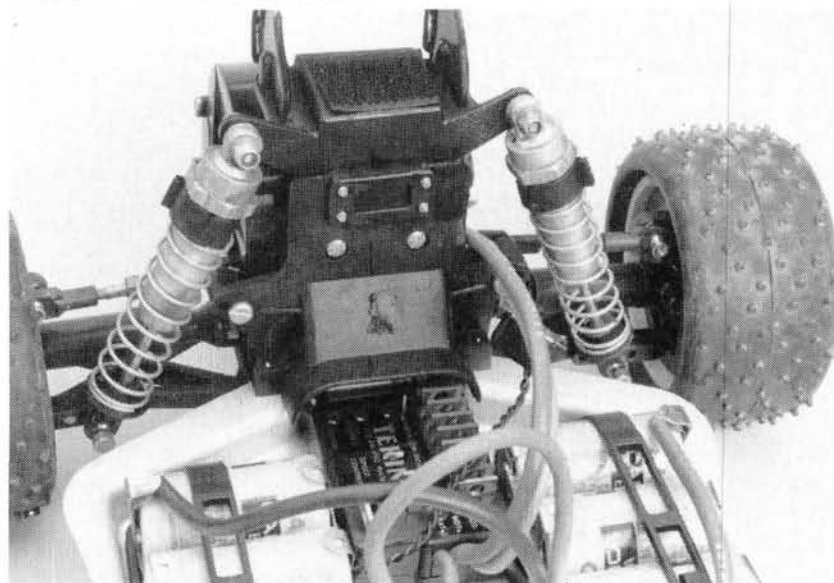
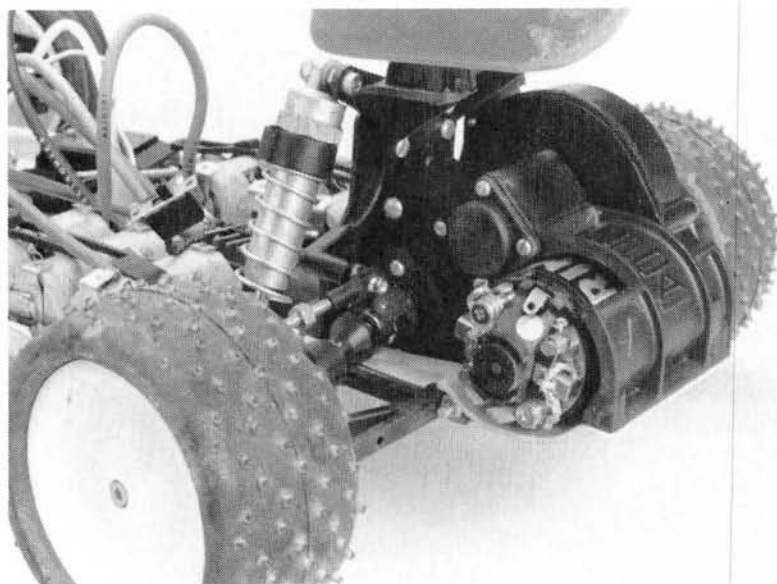
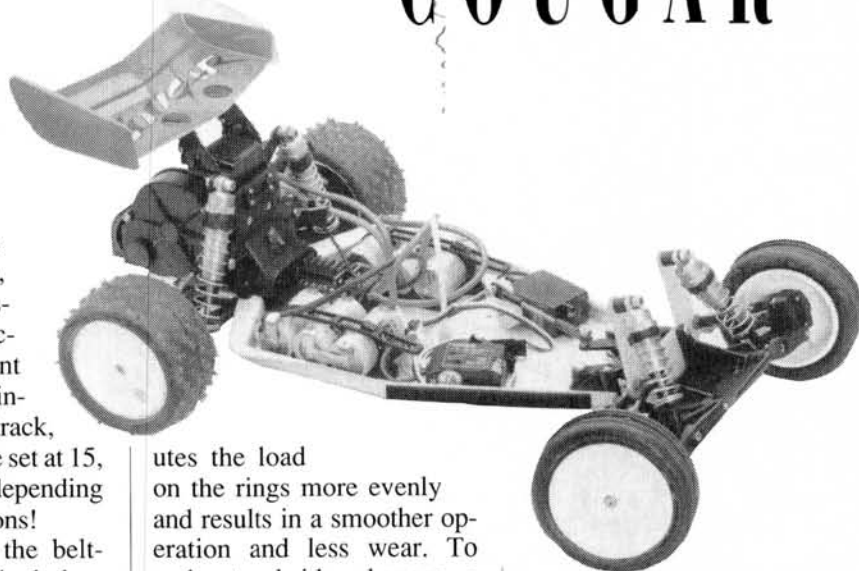
"...the instructions are clear and include a list of necessary tools and some good tips,..."

the optional, sealed, precision ball bearings.

ASSEMBLY

Assembling the Cougar is easier than assembling the original Top Cat. The Cougar has fewer parts, and the instructions are clear and include a list of necessary tools and some good tips, i.e., "For the best performance, it's very important that great care is taken to ensure free movement of all parts." Need I say more?

First, you'll have to attach the rear bulkhead and suspension arms to the aluminum chassis plate. For reasons unknown to me, the next steps involve the assembly of the shock absorbers. It doesn't really matter when the shocks are assembled, but at this



Left ■ (Top): Rear motor guard offers good protection, even for end bell. A Joel Johnson Modified was used. ■ (Bottom): Rear battery holder is rounded for a stick pack, so a side-by-side cell format would be a problem. Schumacher's optional saddle mounts are convenient, but they hold only three on each side.

SCHUMACHER COUGAR

Type 2WD off-road buggy
Scale 1/10
Sug. Retail Price \$250

DIMENSIONS:

Overall Length 15.5 inches
Width 9.5 inches
Height 6.25 inches
Wheelbase 11 inches
Front Track 8 inches
Rear Track 7.625 inches

WEIGHT:

Gross (w/bat.) 53 ounces

BODY:

Type Single-seater off-road
Material Polycarbonate

CHASSIS:

Type Pan
Material Aluminum

DRIVE TRAIN:

Primary Gear
Transmission Belt-driven
Differential Ball
Bearings/Bushings Sealed ball bearings

SUSPENSION:

Type (f/r) Single A-arm
with upper control link
Dampening (f/r) Oil-filled,
coil-over shocks

WHEELS:

Front: Type One-piece plastic
Dimensions (DxW) 2.1x.75
inches
Rear: Type One-piece plastic
Dimensions (DxW) 2.1x1.5
inches

TIRES:

Front Ribbed
Rear Mini-spike

ELECTRICS:

Motor 540/05*
Battery Req'd 6-cell stick*
Speed Controller *
* not included

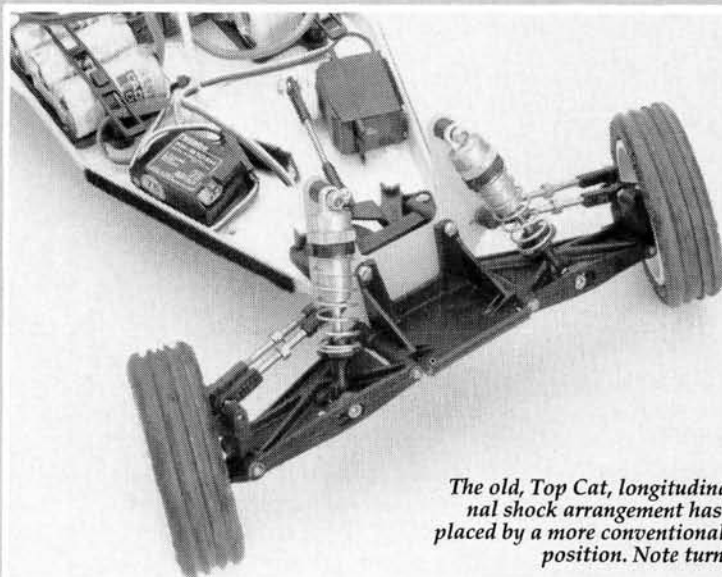
OPTIONS AS TESTED:

Tekin 700 ESC; Trinity Joel Johnson Modified; Magic Motorsports matched SCEs; Schumacher saddle-pack battery holders; Futaba Magnum Senior, S-132H servo and R102H mini-receiver, Schumacher saddle-pack battery holders, Schumacher sealed bearings

COMMENTS:

The Cougar's front end is the standard, lower-A-arm, upper-link setup (very effective; almost maintenance-free). To run matched cells, use the optional saddle-pack holders. If you plan to race, replace the bushings with sealed bearings.

COUGAR



The old, Top Cat, longitudinal, internal shock arrangement has been replaced by a more conventional upright position. Note turnbuckles.

stage, there's nothing to which they can be attached. I decided to leave the shocks out until I could mount them onto something.

Compared to the Top Cat, the front suspension is a pleasure to assemble. The suspension and steering assemblies pivot on 1/8-inch-diameter pins, and this should allow for unrestricted movement of the arms. If there's even the slightest binding, run a 1/8-inch drill bit through the holes by hand to ensure that there are no defects that would inhibit the movement. If you make the arms' movement as smooth as possible, you'll be able to use the suspension to its maximum potential.

With the front suspension still a separate unit, bolt the steering assembly onto the chassis. The steering was designed to minimize bump-steer and to make the best use of the servo movement. To make the best use of the available servo travel, the steering lever and radius arm (bellcranks) have an

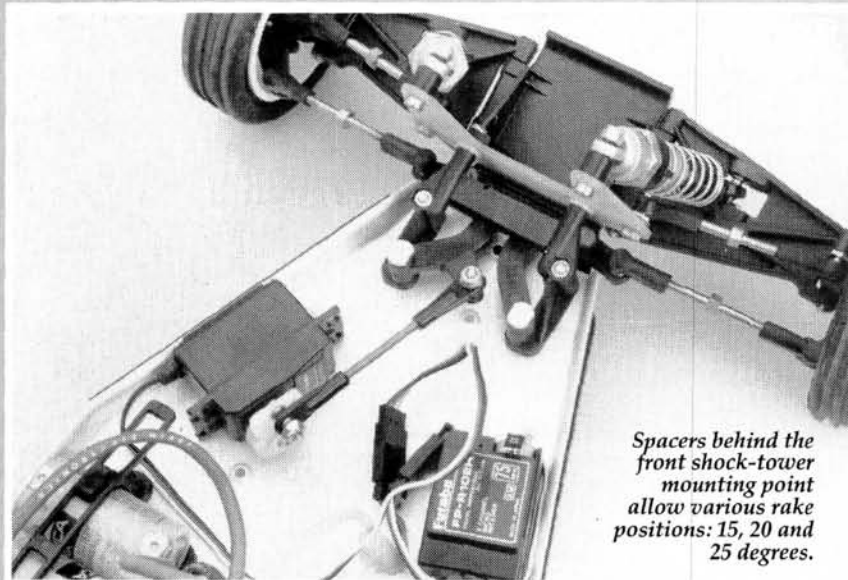
actuating arm that travels almost in a linear motion.

The front suspension plate with the suspension arms attached is now bolted to the chassis, and this is where the adjustable rake angle of the front end comes in. The chassis is sandwiched between the lower suspension plate and the upper plate, and attached to this is the steering hardware. With only the front suspension plate attached to the chassis, there's a noticeable amount of flex, which allows for the rake-angle adjustments.

With the shock tower in place, a pair of screws are run through uprights on the front suspension plate and through the shock tower to the steering assembly, which is already firmly bolted to the chassis. Spacers, which are included in the kit, space the front shock tower from the steering assembly and determine the rake angle of the front end. With no spacers, the rake angle will be 25 degrees; with one spacer behind either side of the shock tower,

the rake angle will be 20 degrees; and with two spacers, the rake will be 15 degrees. The instructions recommend using one spacer as a starting point for a rake angle of 20 degrees; changes can be made later for varying track conditions. After buttoning-up the front and rear suspension, I then assembled and attached the shocks.

The remaining assembly involves piecing together the transmission and attaching it to the chassis. The transmission is unique because it's the only factory belt-drive tranny included with a 2WD car. The jury is still out on whether or not the belt-drive is an advantage over gear-drive transmissions, although the design is such that it uses the belt to its best advantage. The belt-drive transmission uses a flat pulley with guides on either side, instead of the barrel-pulley that's used on 4WD cars. Because of its shape, the barrel pulley doesn't allow the belt to run off-center even without the



Spacers behind the front shock-tower mounting point allow various rake positions: 15, 20 and 25 degrees.

use of guides, which cause drag when the belt rides against them. This was another brilliant design feature, but there was no way to align the upper and lower pulleys precisely enough to keep the belts from walking. The Cougar pulleys now have guides, which may cause more drag, but they're much less of a headache.

Like the rest of the car's design, the transmission is very simple. There are only two shafts and two pulleys inside the transmission, which keeps rotating mass to a minimum and should provide brute acceleration. For smoother operation, the diff is a standard ball-type that uses 14 balls and odd-sized diff rings (but so does the JR-X2). The diff's rings use sandpaper that must be glued on, which prevents the rings from slipping under acceleration.

Adjusting the diff is a simple operation, and you can do this on the starting line from the outside of the car. The only fault I can find in this design is

"The transmission is unique because it's the only factory belt-drive tranny included with a 2WD car."

that the thrust bearings behind the diff-adjusting screw are exposed to the elements. When contaminated with dirt, the thrust bearings can't operate as intended, and this causes the diff to come out of adjustment. It shouldn't take more than 1 hour to get the transmission together and installed. All that's left is choosing and installing the electronics and painting the body.

Starting from the front to the back, I installed an old Futaba* Magnum Sr. radio with a new micro receiver and a S132 high-speed servo. The servo is mounted to the chassis with two-sided tape, and there's a two-piece wire and collar linkage to connect it to the steering hardware. I decided to leave the wire linkage in the box and go for some Pro-Line* 4-40 threaded rod

and rod ends, because more precise adjustments can be made, and they can take much more abuse.

The batteries I used are the Magic Motorsports* assembled SCE saddle packs, which are mounted in optional Schumacher saddle-pack holders. I found another flaw in the battery-mounting system. In the stock configuration, the batteries are intended to run from the rear bulkhead up the center of the car, but because of the shape of the battery cavity in the bulkhead, you can only use stick packs. There are optional holes drilled in the chassis sides, and with the use of an additional battery cup, you can run the battery pack from side to side. Even in this configuration, only a stick pack can be used because there isn't enough

(Continued on page 134)



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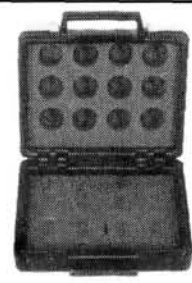
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KYOSHO PORSCHE 911

(Continued from page 40)

clever, hidden mounts. They preserve the car's scale lines better than traditional body posts, which would stick out of the body.

TEST DRIVE

Because of the Porsche's nature, I didn't have to take it to the track for hot laps. Instead, I let my father (a Porsche fanatic!) test drive the car in a parking lot. He didn't have much experience with R/C cars, so he was the perfect test driver. (An experienced driver would pilot the car with ease, but I wanted to see how the car would handle for a novice.) Well, he went forward, backward, left and right. He also managed to bump a few car tires.

The kit's standard gearing enabled Dad to get used to the car slowly. The extra-large resistor (included for use with the stock three-position speed controller) allows longer runs at lower speeds without damage to the resistor. Despite its limited travel, the suspension kept the Porsche firmly on the ground. This makes learning to drive it easier than wrestling with a car

that has a poor suspension.

After 10 minutes, the battery pack started to lose its charge, so I called Dad into the pits. Despite his initial difficulties controlling the car, his smile told the whole story. He was amazed at how much fun it was to drive and, eventually, I'll give it to him. (When I do, it probably won't be quite the same. I like the way it looks, but there are so many other possibilities....)

ENDLESS POSSIBILITIES

Because the car is designed to fit on the Ultima II chassis, conversion possibilities are endless. It already has the basic ingredients for an off-road conversion: just change the body, take the spacers off the shocks, mount the rear shocks on the existing shock tower and give them long springs, tack on a new set of tires and wheels, and you're ready to hit the dirt! With the addition of a graphite chassis, an electronic speed controller, a new radio system, adjustable upper links for the suspension and a modified motor, you can run with the best in open-class off-road racing! With a different body and larger tires and wheels, you can have an off-road racing truck. Even if you want another

scale car, the Porsche can easily be converted to a Nissan 300Z. The possibilities are endless!

**Here are the addresses of the companies mentioned in this article:*

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.
Coverite, 420 Babylon Rd., Horsham, PA 19044.
Testor Corp., 620 Buckbee St., Rockford, IL 61101.

PROJECT LYNX

(Continued from page 53)

for a setscrew, so you avoid having to weaken the axle. and there's no setscrew to maul the axle if the hub loosens. Both hubs are hard-anodized, and this makes them 50 percent more durable and almost impervious to wear. Their lightness keeps rotating mass to a minimum, and this improves acceleration out of turns.

A Trinity, 120-tooth, thin spur gear finishes the axle assembly. The gear's slimmer profile is designed to reduce friction between the pinion and spur. The spur gear is fitted with Team Losi's* TC

(Continued on page 110)

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FIRST LOOK:

by CHRIS
CHIANELLI

Conan's ride!



PHOTOS BY YAMIL SUEZ

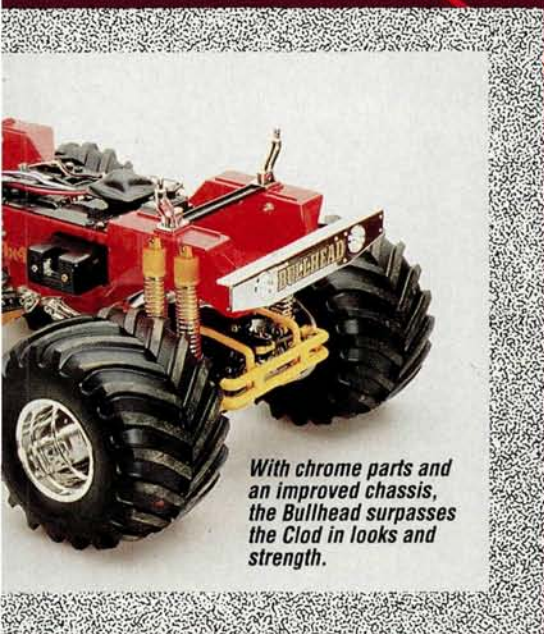
Although the shocks are yellow, they're not the oil-filled yellow shocks.



T A M I Y A

BULLHEAD

LEAVE IT to the people at Tamiya* (masters of the monster truck!) to throw a Kenworth-type body onto a 4WD monster chassis and, somehow, make it look good. OK, I'm sure some self-appointed critics are, at this moment, saying, "But full-scale tractors have *two* sets of drive wheels



With chrome parts and an improved chassis, the Bullhead surpasses the Clod in looks and strength.

on the rear." Have you forgotten that in the monster-crushing world (be it full scale or model scale), anything goes?

For those who love to "trick-out" their monster trucks, Tamiya's Bullhead provides a head start. Right out of the box, this truck is impressive! Its wheels, suspension ladders, fuel tanks, air-filter intake, stacks and grill come chrome-plated. Its red chassis and its eight yellow shocks are of molded,

ABS resin, and its body is white, so painting it with your favorite color is no problem. (I used Coverite's* Body Shop opaque yellow; it dried quickly and just three coats provided a great covering.)

If you guessed that the Bullhead has a Clod Buster undercarriage, you're right! (Hey, the Blackfoot chassis was first used on the Frog, then the Monster Beetle and, more recently, the Mud Blaster—no one seems to mind! Besides, the Clod Buster has been the champ for so long that it deserves a chrome robe!) Anyway, because the center section of the Clod's chassis often develops stress cracks, Tamiya has strengthened the one on the Bullhead. This should make a major difference to the truck's durability, but I'll leave those details for a full-blown track report.

This unique truck will spur fresh creativity. It will be interesting to see what you crazy people will make it into and how you'll use it in competition. I'm sure that Tamiya is working hard on a "Bullbody" (the Bullhead's rear half) for something I know will be the next craze: off-road tractor-trailer racing!

Whether you like the Bullhead's macho image or not (I love it!), one thing is certain: it will be a real attention-getter; one that's destined to go down in R/C car history as the "Conan the Barbarian of Monster Truckdom!"

*Here are the addresses of the companies mentioned in this article:

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.
Coverite, 420 Babylon Rd., Horsham, PA 19044. ■

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The final event of the Speedworks 1990 Sportsman's Triad Cup Series was held at the Ranch Pit Shop in Pomona, CA. This on-road race followed the high-speed oval racing and off-road racing that took place in Browns Mills, NJ, and Detroit, MI. In addition to being fun, the Sportsman's Cup series gave amateur drivers the chance to talk to and race with

SPEEDWORKS SPORTSMAN'S CUP

by JOHN HUBER

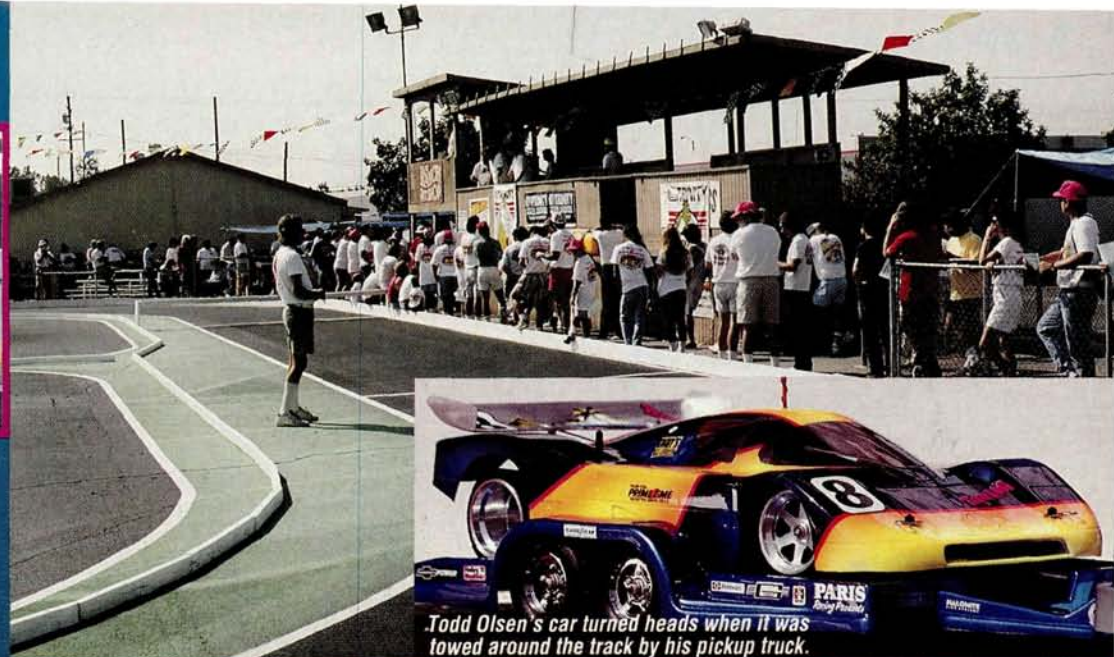




the nation's leading drivers.

THE RANCH

Located on what was once the site of a famous 1/8-scale gas-car track, the Ranch Pit Shop's new on-road electric-car track had been given a fresh coat of sealant and trimmed with green and white paint. During the event, the track was periodically sprayed with a traction compound (I

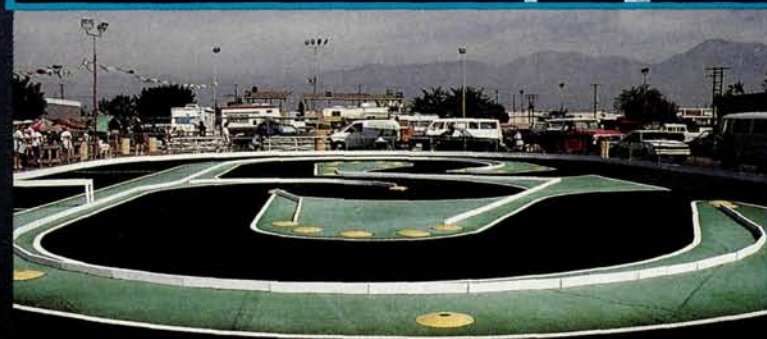


Todd Olsen's car turned heads when it was towed around the track by his pickup truck.

think it was nothing more than sugar and water), which made it slightly tacky and helped the foam tires to do their thing!

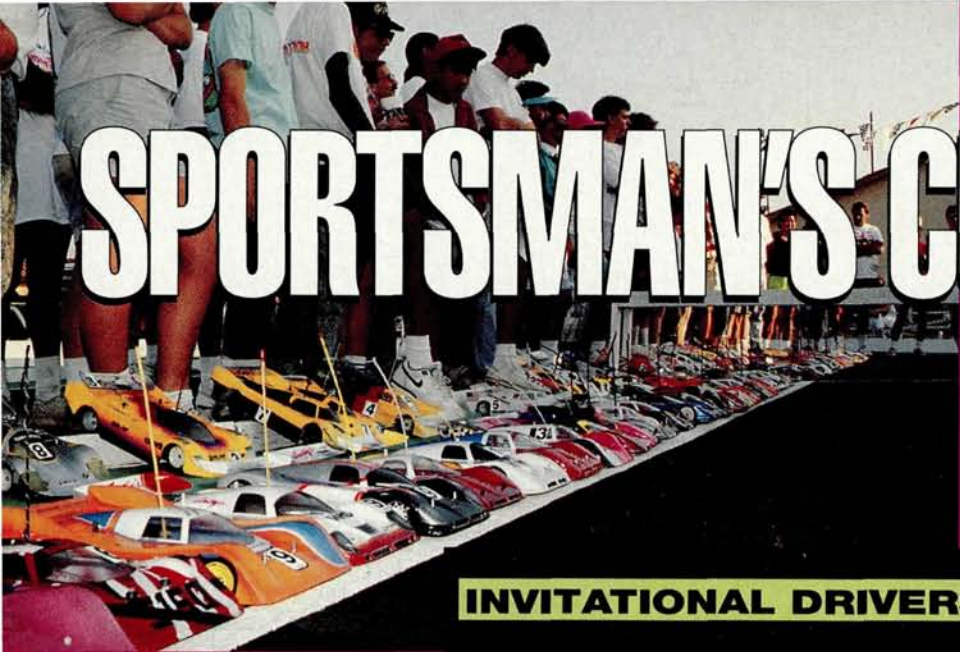
The on-road track, a large off-road track and a snack bar are behind the impressive

CALIFORNIA CORNERS



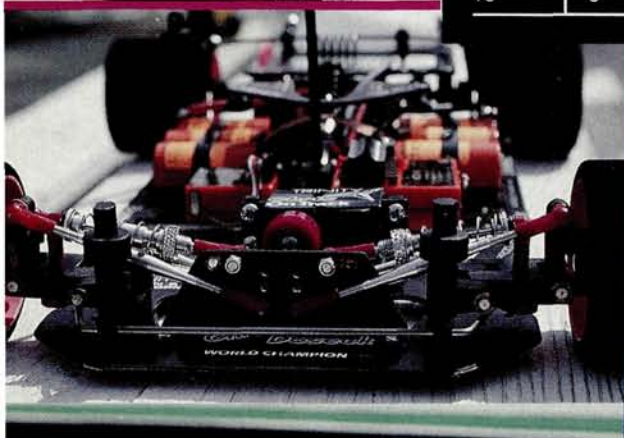
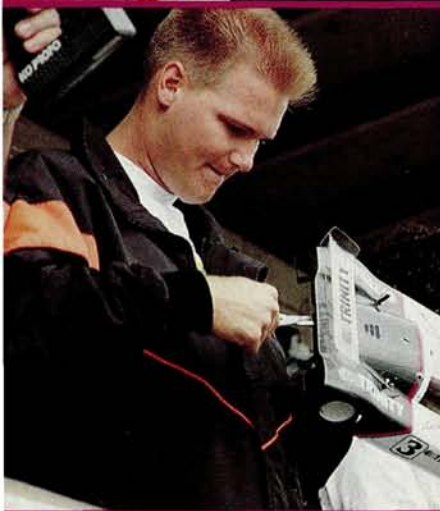
Above: The Ranch Pit Shop's beautifully laid-out roadcourse has replaced the famous 1/8-scale gas track. Most drivers kept their distance from the yellow "dots" in the turns; the few who couldn't avoid hitting them caught some impressive air! Right: Trophy time! Left—Joel Johnson (many of you know him); right—Rob Press (I'm sure you'll be hearing a lot about him in the future).

SPORTSMAN'S CUP



INVITATIONAL DRIVERS

Fin.	Race				Name
	I	II	III	IV	
1	1	1	2	1	Joel Johnson
2	2	4	1	2	Tyree Phillips
3	6	3	3	6	Kent Clausen
3	4	5	4	5	Frank Calandra
3	3	6	6	3	Gil Losi Jr.
6	6	2	6	6	Gary Kyes
7	6	6	5	4	Chris Dosek
8	5	6	6	6	Bob Light
9	6	6	6	6	Ron Rosetti
10	6	6	6	6	Andy Jacobsen



Left: Chris Dosek's Lynx II had an independent front end that was damped by two Delta shocks. The system was also equipped with an anti-roll bar and A-arms with adjustable upper links.

hobby shop. Because I once worked in a hobby shop, I always visit them whenever I travel, and I had never seen such a well-stocked facility!

Along with merchandise from just about every company I could think of, the shop stocked *all* the new Losi products. Needless to say, I gave my wallet a workout!

TRUE SPORTSMEN

After a minor misadventure while looking for a camera shop (let's just say that this New Yorker learned a lesson about jaywalking from the California Highway Patrol!), I was ready for some racing!



Ernie Provetti of Trinity is responsible for organizing the Speedworks races. He and the participants enjoyed themselves immensely.



Tyree Phillips drove very smoothly throughout the weekend. He was right on Joel's tail most of the time and finished 2nd.

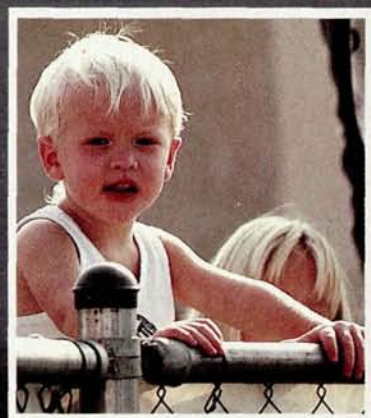
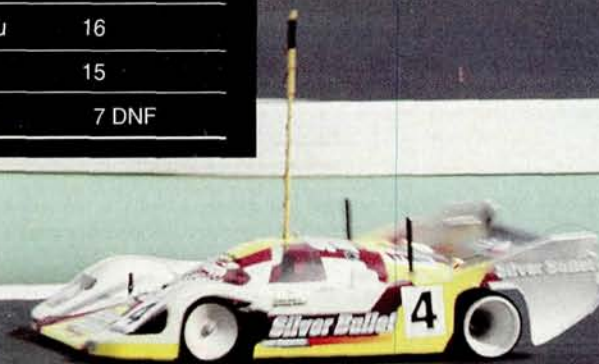


1/10-SCALE A-MAIN

Fin.	Qual.	Name	Laps
1	1	Bill Goldsmith	17
2	4	Marty Desbrow	17
3	6	Rob Press	17
4	2	Randy Doshier	16
5	7	Willy Decker	16
6	3	Javier Gutierrez	16
7	5	Chris Walrod	16
8	9	Paul Nadeau	16
9	8	Ed Correa	15
10	10	Bill Martin	7 DNF



Why ask why?—try Bud Dry. That's what Raul Villavicencio did, and it won him 1st place in 1/12-scale Concours.



1/12-SCALE A-MAIN

Fin.	Qual.	Name	Laps
1	3	Willy Decker	33
2	2	Randy Doshier	32
3	1	Mike Mayberry	32
4	8	Joe Kolp	32
5	7	Marty Desbrow	32
6	9	Eric Vasutin	30
7	1	Paul Smith	28
8	4	Rob Press	9 DNF
9	5	Billy Bowerman	0
9	6	Steve Fife	0



Here, the Bud Dry car lands approximately 10 feet past the dot that sent it airborne—ouch!

Chris Dosek's Lynx II looked impressive, but he couldn't get it to perform as well as his 1/12-scale car had in Singapore.

On Saturday morning, the Qualifying races and the Invitational races began. Unfortunately, the auto-lap counting system wasn't working (apparently, the new high-frequency speed controllers interfere with some counting systems and render them useless), and ROAR Administrator John Thawley really had his hands full keeping track of the blazing cars!

The speed and punch of the stock motors was impressive, and this, combined with the track's tight turns, made for some serious crashes. During the races, Phred Gebauer (better known as the "Mouth of the South") provided



Trinity's Kevin Mauer was busy in the pits checking each racer's motor for optimum performance. For most drivers, this was very informative.

an excellent commentary. He did his best to warn drivers about hazards on the track and to notify them whenever the leaders were trying to pass. Everyone yielded to the leaders, and I was impressed by this sportsmanship. I've been to races where slow drivers intentionally try to keep leaders from passing with such comments as, "You'll have to work to get by me!" That's just plain stupid! Letting faster cars pass decreases the chances of a crash and increases your chances to finish. Face it, these races don't offer million-dollar prizes. What they do offer, however, is the opportunity to race and have fun.

It's an old cliché, but it holds true (especially in the Sportsman's Cup Series), "It's not whether you win or lose—it's how you play the game." It was in this spirit that the Cup recognized two racers for their true sportsmanship: Jeremiah Barrow (1/12 scale) and Car Action's own Mike Lee (1/10 scale).

CONCOURS

The Concours competition is one of my favorite events. It gives drivers an opportunity to show their creativ-

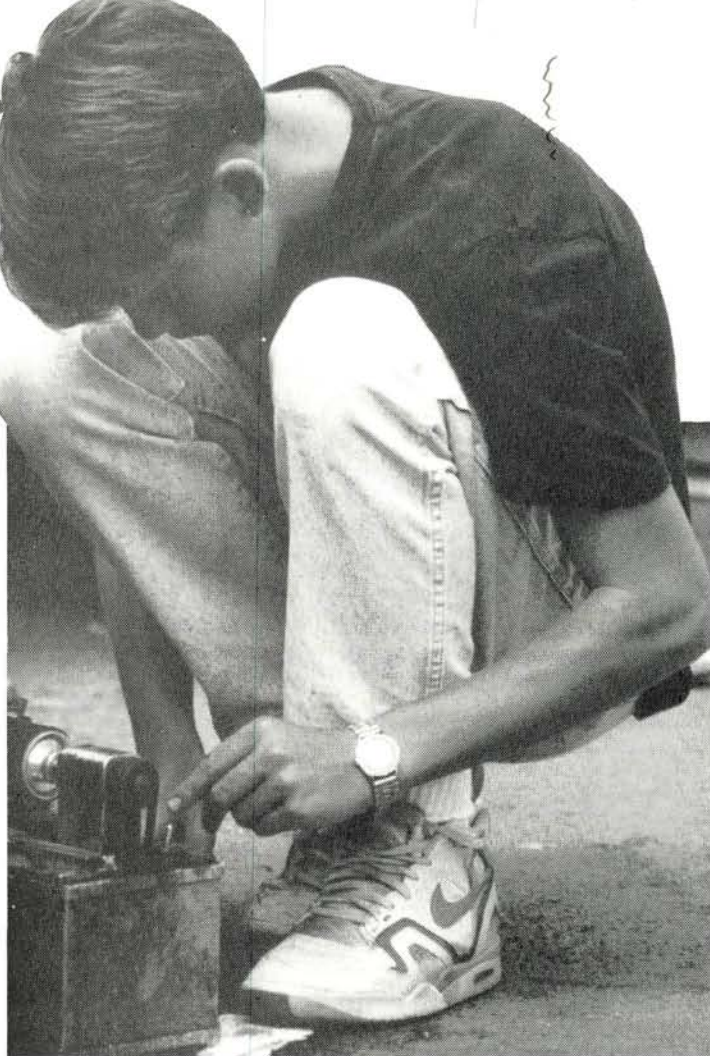
ity and compete in a less stressful event. For spectators, it's a colorful display that often provides inspiration for a future creation!

At the Sportsman's Cup, all the

cars had GTP-style race car bodies. Some were painted to match their full-scale counterparts; others were creative "masterpieces." Raul

Villavicencio took top honors in the

(Continued on page 206)



SUPER SEMINARS!

Sportsman's Cup racers got a lot more than they bargained for. The racing was great, but the informative seminars that were held between the races were great, too!

Ernie Provetti, Kevin Mauer and Dave Willems of Trinity explained how their computer dyno is used to test a motor's performance before a race. Kevin also discussed how various brushes and springs affect a car's performance, and Ernie showed the curious crowd Trinity's new Equalizer motor.

Mike Lavacot and Kent Clausen demonstrated Lavco's new dyno, which will be available soon. Kent discussed the dyno's function and revealed some of his motor setup secrets. Mike showed Lavco's charging system and discussed the misconceptions and realities of charging SCE cells.

Tyree Phillips' seminar shed some light on the problems associated with the new high-frequency speed controllers. Because of their in-

creased pulse rates, they often interfere with lap-counting systems. Tyree said the problem is being addressed and should be corrected soon.

The seminars provided everyone with valuable information, and it was great to have the opportunity to ask the pros questions. If you ever have a chance to attend, I strongly suggest that you do!

After the last seminar, a drawing was held, and many racers left with big smiles and arms full of prizes!

S PONSORED BY KYOSHO and R/C Car Action, the NR/CTPA returned to Champaign, IL, for the 1990 World Truck Pulling and Monster Truck Competition. This year's event attracted the largest field ever: nearly 400 com-

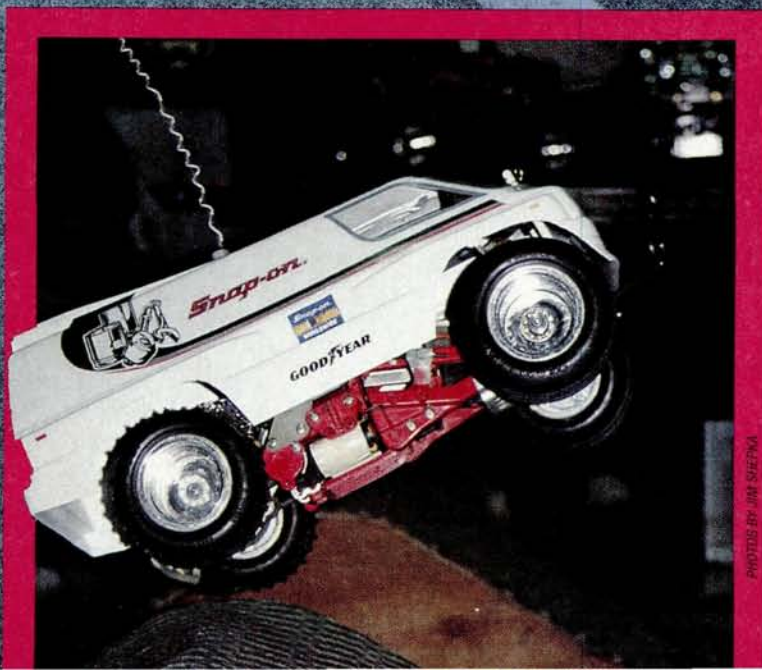
petitors converged on the Leonard Recreational Center for a shot at a national title in more than 20 events. The

organization's President, Dave Sproul, and his able-bodied crew expected a crowd, but the throng of late entrants was almost too much for them to handle.

Draggin' Masters!



by JIM SHEPKA



NR/C

WORLD CHAMPIONSHIPS

Inspecting all vehicles before the opening ceremonies was very time-consuming and frustrating. Because of the many late arrivals, the scheduled 10 a.m. opening was delayed for almost three hours, but there were very few complaints. People took advantage of this time to renew old friendships and fine-tune their equipment. Many visited "manufacturers' row," which was set up just off the main hall. There to display their products and answer questions were representatives from Kyosho, CCP (Custom Chrome Products), Black Magic Racing Motors, EMC (Engi-



John Haseldon of Columbia, SC, turned a lot of heads with his scratch-built puller. From its anodized fenders and wing to its hand-cut rear tires, the Annihilator was a real show-stopper!

neered Model Products), Parma, Sassy Chassis, AstroFlight, AJ's R/C and R/C Car Action.

After the delayed opening ceremony and drivers' meeting, the much anticipated event was off and running. First to the line were the two-wheel stock pullers. With three rounds of qualifying scheduled, there seemed to be plenty of time for them to get dialed-in, but even the best-laid plans are subject to change, and this event was no exception (see sidebar).

2WD STOCK

A mechanical engineer I'm not, so it always amazes me when I see a basically stock vehicle straining to pull nearly 10 times its own weight! Jim Bee's Traxxas outclassed the field with a brilliant 25-foot, 10-inch pull at a 40-pound weight. Willie Bee's Kyosho-powered Traxxas Eagle went 19 feet for the runner-up spot, and Pete Petry's Frog managed a bronze with a solid 18 feet, 3 inches.

2WD SUPER STOCK

With nearly 30 pullers entered, this class was one of the weekend's most competitive. With his Blackfoot, Chaz

There was plenty of "hang time" during the time trials. Note the huge tires on this truck.



Fin	NAME	VEHICLE	MOTOR	SPD. CTL.
2WD STOCK				
1	Jim Bee	Traxxas	n/a	n/a
2	Willie Bee	Traxxas	Reedy	Novak
3	Pete Petry	Frog	Mega 360	Futaba
4	Dawn Fernando	RC10	360ST	Novak
5	Andy Biggs	Frog	Stock	Novak
2WD SUPER STOCK				
1	Chaz Bee	Blackfoot	n/a	stock
2	Margaret Brockman	Traxxas	Reedy	Traxxas
3	Dutch Esgro	Big Brute	Mega 360	Novak
4	Billy Gabbert	Hi-Rider	Mega 360	Futaba
5	Mark Fernando	Big Boss	360ST	Zeta
2WD MODIFIED				
1	Albert Janicki	Grasshopper	AstroPull	stock
2	Dutch Esgro	Blackfoot	AstroPull	AstroFlight
3	David Hester	Grasshopper	AstroFlight	scratch
4	Jason Choiniski	Cold Buster	Trinity	Robert
5	Keith Myers	n/a	AstroPull	Bolink
2WD SPORTSMAN				
1	Mark Fernando	Bennett	Mabuchi	Zeta Xtra
2	Margaret Brockman	scratch	Reedy	Traxxas
3	John Beecher	Pro Puller	n/a	SP 1500
4	Albert Janicki	Grasshopper	Mega 360	stock
5	Peter Kulassa	scratch	360ST	Novak
2WD OPEN I				
1	Kyle Haynes	scratch	AstroPull	Zeta
2	Mike Dozier	Pro Puller	Black Magic	Zeta
3	Marcia Arman	Beeliever	AstroPull	Zeta
4	Peter Kulassa	scratch	AstroPull	Novak
5	Brian Gallagher	scratch	Black Magic	scratch
2WD OPEN II				
1	Jim Bee	Beeliever	AstroFlight	AstroFlight
2	Scott Weigel	scratch	AstroFlight	Zeta
3	Greg Kinsey	scratch	AstroPull	AstroFlight
4	John McNamara	Custom RC	Astro Flight	Zeta Xtra
5	Leslie Prescott	scratch	AstroFlight	Robert
4-WHEEL STOCK				
1	Daryl DeJohn	Optima Mid	Black Magic	Kyosho
2	Pat Bradley	Big Wig	Twister	Novak
4-WHEEL MODIFIED				
1	Steve Carmine	Bruiser	Black Magic	scratch
4WD OPEN I				
1	Sean Cullen	Beeliever	AstroFlight	Novak
2	Don Fisher	Custom RC	Astro 05	n/a
3	Brian Daugherty	Black Thunder	Black Thunder	Novak
4	John Walter	scratch	AstroFlight	scratch
5	Tom Barth	Bruiser	Black Magic	scratch
4WD OPEN II				
1	Larry Bennett	Pro Puller	Black Magic	Zeta Xtra
2	Dale Arman	Beeliever	AstroFlight	Robert
3	Chris Fine	Pro Puller	FireFox	Zeta
4	Dale Arman	Beeliever	n/a	Zeta
5	Brian Sheler	scratch	Black Magic	Zeta

Bee (of the famed South American Killer Bee clan!) was top dog at the 50-pound limit with a 28-foot, 11¹/₄-inch effort. Margaret Brockman's Reedy-powered Traxxas ended up a mere 1/8 inch short of a tie and took the 2nd spot. Less than 1 inch behind her was Dutch Esgro with a 28-foot, 10¹/₂-inch pull, and he was followed by Billy Gabbert, who was 1/4 inch behind in 4th!

2WD MODIFIED

With Astro pulling power, the "Pennsylvania Connection" of Albert Janicki and Dutch Esgro finished in 1st and 2nd, respectively. Janicki's Grasshopper maxed-out at the 80-pound weight limit with a pull of 28 feet, 10³/₄ inches, and Esgro's puller was 18 inches behind. David Hester pulled a close 3rd with another Astro-powered 'Hopper.

2WD SPORTSMAN

The second-largest class saw a good shootout—at least seven rigs were within striking distance of the eventual winner. From Sunderland, MA, Peter Kulesa's Kyosho-powered scratch-built took 5th with a strong 28 feet, 4¹/₄-inch effort; 4th-place Al Janicki's Grasshopper kept the honors coming with 28 feet, 9³/₈ inches; and John Beecher's Hi-Pro Puller took the bronze with 28 feet, 11³/₄ inches. Margaret Brockman's Reedy-powered scratch-built broke into the elusive 29-foot range. Pulling 80 pounds, these vehicles were impressive, and top honors went to Mark Fernando's Bennett-prepared rig—29 feet, 10¹/₂ inches.



Paul Spooner doesn't let his handicap interfere with his fun. He drove from Massachusetts to compete!

Meeting the Challenge

It's not unusual for enthusiasts to travel many miles to compete in a regional, national, or a world event, but it is unusual for a handicapped R/Cer to make this type of trek.

Since he was very young, Paul Spooner of Brockton, MA, has been affected by a rare form of muscular

atrophy that now keeps him in a wheelchair. NR/CTPA truck and tractor pulling are perfect for him, and with the help of a few friends and his specially equipped van, Paul made the trip to Champaign to compete this year.

I first saw him compete at the NR/CTPA East Coast Regionals in the 2WD Open I Class. He had mechanical difficulties, but he took home the concours gold with his beautifully prepared "Undertaker." Paul is a full-time spokesperson for a non-profit organization that speaks for the rights of the handicapped. Although driver stands can be a problem at times, Paul said that event organizers have been very accommodating and usually provide a ramp for his wheelchair. Paul has been involved with R/C pulling for about three years. He enjoys the camaraderie, the sportsmanship and, most important, the equal terms on which he competes.

DUAL-MOTOR STOCK

1	Roy Allen, Jr.	Clod Buster	Mega	stock
2	Todd Eckelberg	Clod Buster	360ST	stock
3	Ed Kramer	Clod Buster	Black Magic	Novak
4	Matt Wilkins	Clod Buster	Black Magic	Zeta
5	Keith Myers	Clod Buster	Mega 360	stock

DUAL-MOTOR MODIFIED

1	Doug Howard	Clod Buster	n/a	n/a
2	Duane Landheer	Clod Buster	Black Magic	Zeta
3	Kelley Harris	Clod Buster	Black Magic	Zeta
4	Rob Chinski	Clod Buster	AstroPull	Robert
5	Brian Gallagher	Clod Buster	AstroFlight	scratch
5	Albert Janes	Clod Buster	AstroFlight	Zeta

MONSTER TRUCKS

1	Mike Kellner	Big Brute	240ST	Duratrax
2	Kevin Florence	Big Brute	Mega 360	n/a
3	Claude Kuzniak	Blackfoot	360ST	Futaba
4	Jerry Moss	Monster	Wimpy	Novak
5	James Berrier	Blackfoot	360ST	stock

2WD SUPER STOCK

1	Ed Avery	JR-XT	B&R Bullet	Novak
2	Bill Jeric	Outlaw	Parma	Novak
3	David Kilian	King Cab	Black Magic	Novak
4	Mitch Hazael	King Cab	540RS	Traxxas
5	George Ruff	JR-XT	FireFox	Novak

2WD MODIFIED

1	Gregg Pierce	Blackfoot	Trinity	Novak
2	Kevin Florence	Double Dare	Astro 05	n/a
3	Bob Pierce	Blackfoot	Trinity	Novak

4WD STOCK

1	Vincent Gamache	Clod Buster	stock	stock
2	George Gendron	Clod Buster	Mega	stock
3	Joey Kirkwood	Clod Buster	stock	stock
4	Albert Janicki	Clod Buster	Mega 360	stock
5	Tom Barth	Clod Buster	stock	stock

4WD SUPER STOCK

1	Bruce Kenney	Optima	Kyosho	Zeta
2	Mike Dozier	Optima Mid	Parma	Novak
3	Ron Crawford	YZ-10	Black Magic	Novak

4WD MODIFIED

1	John Stokes	USA-1	Mega 360	Zeta
2	Joey Kirkwood	Clod Buster	n/a	n/a
3	Greg Markowski	Clod Buster	Trinity	Futaba
4	Larry Papi	Clod Buster	Twister	Zeta
5	Larry Papi	USA-1	Twister	Futaba

OPEN TRUCK

1	Ron Walls	Ultima Conv	Twister	Novak
2	Ed Avery	JR-XT	B&R Bullet	Novak
3	George Ruff	JR-XT	FireFox	Novak
4	Paul Raines	JR-XT	B&R Bullet	Tekin
5	George Barnett	JR-XT	Twister	Tekin

MONSTER TANK

1	Mark Fernando	Blizzard	Trinity	stock
2	Mike Kellner	Blizzard	Kyosho	stock
3	Andy Biggs	Sherman	Speedworks	Novak



Hitch location is critical for proper weight transfer, so this competitor makes sure everything is just right before his run. Note the front ballast.

2WD OPEN I

With more than 55 entrants, this class was by far the most popular. With the sled at 150 pounds, there was a serious chemical reaction taking place on the carpet!—everything from vented cells and fried controllers to burnt armatures and bent axles.

Brian Gallagher showed that he had what it took and placed 5th with a Black Magic-powered scratch-built and a 15-foot, 3³/₄-inch pull. Peter Kulesa continued his impressive showing with a solid 16-foot effort for 4th. From Dorr, MI, Marcia Arman's Astro-powered

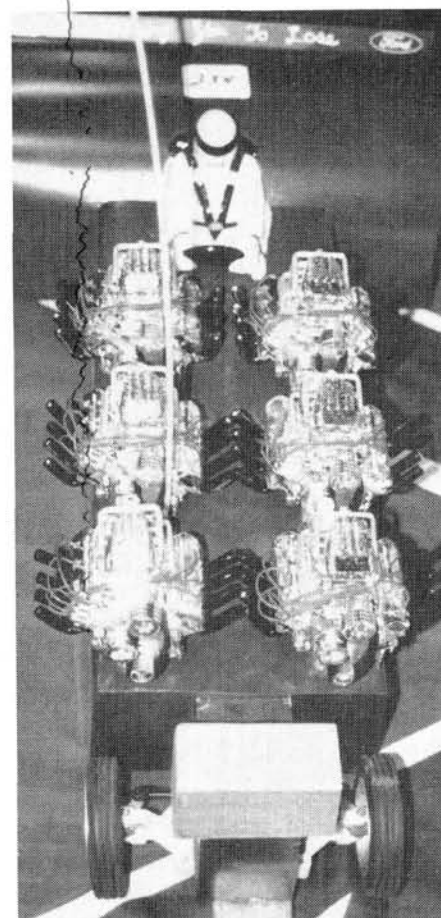
Beeliever chassis made an aggressive pass for 3rd with a 17-foot, 1³/₈-inch pull. Mike Dozier's Black Magic-powered Pro Puller secured the runner-up spot, and Kyle Haynes swept to a win with a strong, 21-foot, 2¹/₄-inch run. Considering the stiff competition, his 3-foot margin was impressive.

2WD OPEN II

This is about as exotic as the sport gets! With up to four motors and R28-40mAh cells aboard each contender, there was enough energy out there to launch the

NR/CTPA

WORLD CHAMPIONSHIPS



A "six-pack" of Rodaks waits to come alive. Actually, they're highly detailed Parma 1/10-scale Hemis. If it weren't for the antenna, who'd know?

Even Nick Nolte and Eddie Murphy couldn't top *this* one! This event must have set some type of Guinness World Record for continuous R/C action! The NR/CTPA is a pretty organized group, but even they couldn't have foreseen the overwhelming number of late entrants who wreaked havoc on this year's event.

With more than twice as many vehicles as last year, organizers were hard pressed to keep ahead. With three 6- to 7-hour rounds of pulling scheduled, there just wasn't enough time to get it all together.

When the first round ended at around 8 p.m. on Saturday, a decision had to be made about the remaining

two rounds. Since this was a world championship event, they decided that the show would go on as planned! Well, to make a long story short, when I returned early on Sunday morning for concours, they were still at it! Yes, this extremely dedicated (or insane, depending on your perspective!) group of R/Cers went right through the night! Rumor had it that tempers ran a little short during the wee hours of the morning, but a little shut-eye soothed everyone.

Who could have guessed that so many people would show up late and throw a wrench into the works. Since there wasn't a predetermined cut-off point for participants, it would have been difficult to

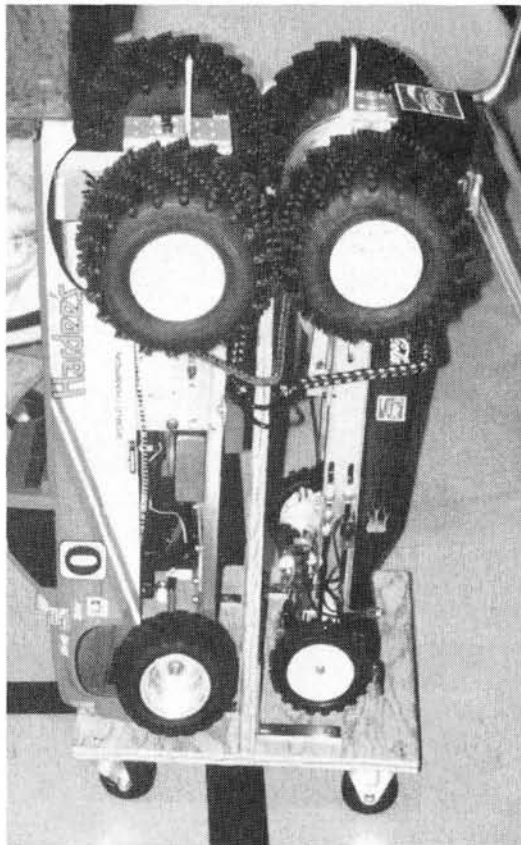


send anyone away, so they ran all night. Tough decisions were made, and I applaud the organizers' efforts.

If this side of the industry is to flourish, participants and organizers must accept the responsibility that goes with it, but growing pains are part of life!

another
48 HOURS

A competitor finds an easier way to transport his hardware. With rigs weighing as much as 25 pounds, any mechanical help is appreciated.



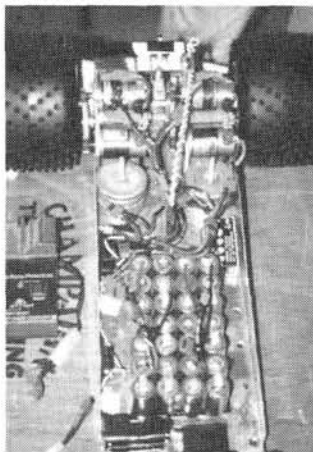
Since there wasn't a radio impound area (drivers were on the honor system), this frequency scanner was used to keep an eye on things. If more than one radio was turned on at any time, the frequency pattern would be picked up on the scanner's screen.



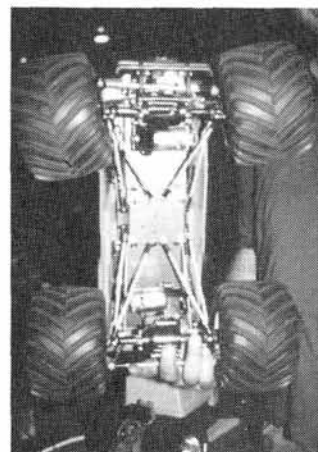
Space Shuttle! Fourteen of the 19 went the distance, and this forced a pull-off of major proportions. One after another, competitors subjected their vehicles to the test. With a 13-foot, 8 1/2-inch effort, Greg Kinsey lead the platoon of pullers who were hooked on 13 feet, and his distance was good enough for 3rd. Second went to Scott Weigel's AstroFlight-powered scratch-built pulling out a fine 14-foot, 1/4-inch run. All this was for naught, because Jim Bee's AstroFlight-powered Beeliever went an incredible 28 feet, 8 1/2 inches! It's hard to put such an effort into perspective, but it's safe to say he was the field's top dog.

4WD OPEN I

With the sled at 175 pounds, Sean Cullen's Beeliever chassis took top honors with pull of 12 feet, 3/4 inch. Don Fisher (yes, from Mars, PA!) took the silver with his Custom R/C Puller that went 11 feet, 10 1/2 inches. The bronze went to Brian Daugherty with Black Thunder motivation and a pull of 5 feet, 8 3/8 inches.



With 28 cells and four motors, this beast has some impressive power. I'd hate to carry it around with me; hey...with this much power, you could ride it!



The custom suspension in this Clod Buster allows much greater travel. This, along with the aluminum chassis, protects the Clod from damage.

4WD OPEN II

The pull-off weight was slightly more than the average size of an NFL interior lineman (or almost the same weight as the "Fridge"—William Perry).

Six drivers made a full 200-pound pull and set up overtime with the sled set at a staggering 356 pounds! John Haseldon was the first out with an effort of 7 feet and change. Brian Sheler from Wyoming, MI (really, that's what his entry slip read), took 5th with a pull of just under 17 feet. Dale Arman's Beeliever was up to the challenge and put in a solid 21-foot, 9 3/4-inch pull; FireFox's Chris Fine went 23 feet, 3 1/4 inches for the bronze; and Dale Arman's AstroFlight-powered Beeliever went one better (literally) and edged out Fine for the runner-up spot by 1 inch. Larry "The King" Bennett showed why he's such a force by powering to the title in his Black Magic Bennett Puller with a wrenching pull of 26 feet, 2 1/2 inches. These people really put on a great show of power and brute force.

DUAL-MOTOR STOCK

This class, which was dominated by Clod Busters, lends itself to close competition. The top three were within inches of one another, but the gold went to Roy Allen with Kyosho power. Todd Eckelberg took 2nd by less than a tire's width over Ed Kramer's Black Magic-powered Clod Buster, and Matt Wilkens and Keith Myers rounded out the top five.

DUAL-MOTOR MODIFIED

At 120 pounds, these people were really stretching the limits of their equipment. Doug Howard dominated with an impressive 28-foot-plus effort; Duane Landheer held it together for a solid 2nd-place pull of 23 feet and change; and Kelly Harris could only manage 21 feet, 11 1/2 inches, but this was good enough for 3rd.

MONSTER TRUCK COURSE

Mike Kellner held the bragging rights when his Kyosho-powered Big Brute tripped the lights in 3.26 seconds; Kevin Florence put in a good effort for runner-up position (3.52 seconds); and the Super Stock Class honors went to Ed Avery of Willington, CT, who drove a Bullet-powered Ultima Outlaw with a run of 3.21 seconds. Hobbico's Bill Jeric (who made only one pass), came up short with a time of 3.22!

(Continued on page 162)

by MARK SYLVESTER

IN PART I, I told you how I modified Team Associated's* RC10 with MIP's* 4WD conversion kit according to the instructions. Now, I'll change its front-suspension geometry; look at its rear suspension, tires, rims, body, wing, bumper and motors; rework its drive train; install a new speed controller and receiver; and

discuss fine-tuning. Before beginning this project, decide whether you want to use a Hyperdrive* system without

M I P ' S 4WD RC10

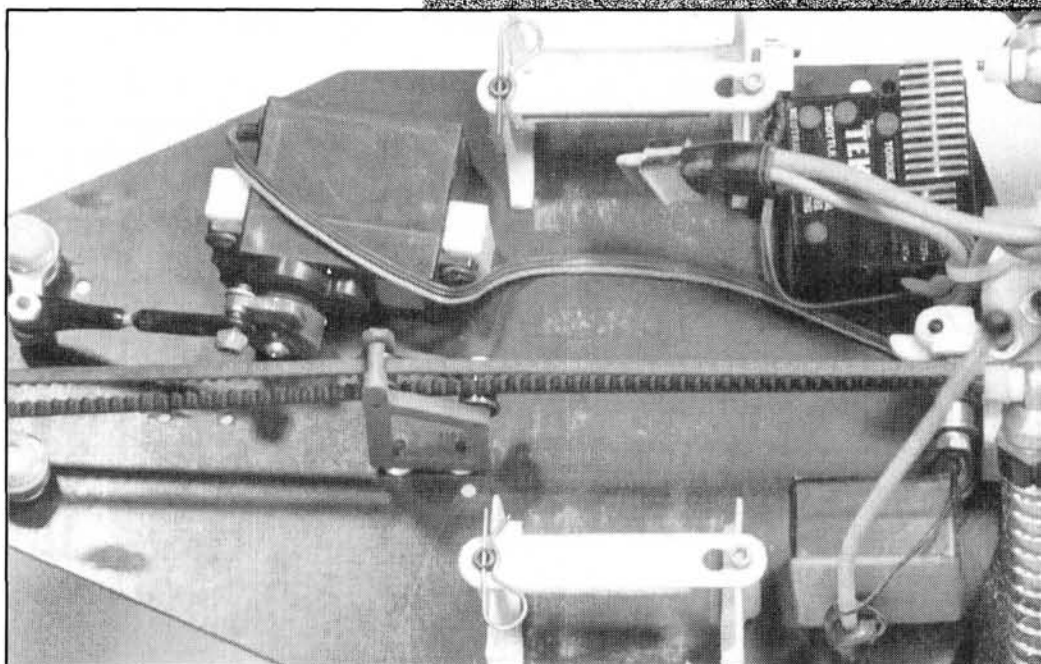
reverse-wind motors, as all modifications and installations will be the reverse of what is usual.

GETTING STARTED

The hinge-pin holes and the tie-rod holes are farther apart on MIP's front hub carriers than on the Associated ones. This subtle difference changes the front-suspension geometry and can drastically affect the car's handling.

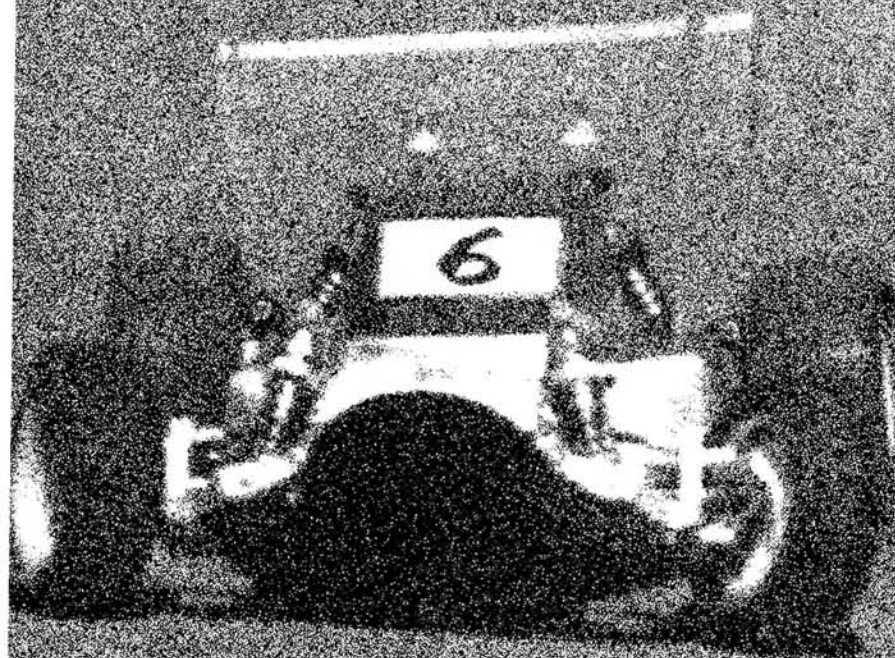
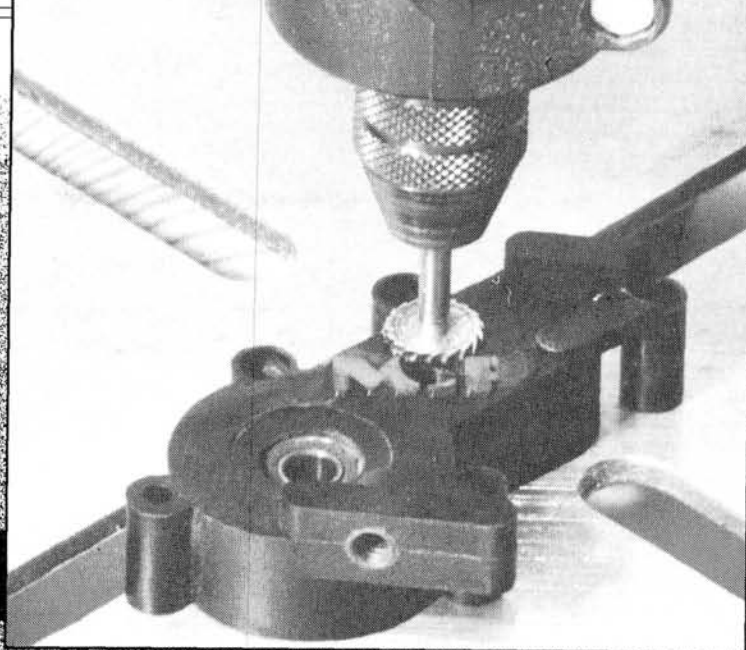
With the front upper tie rod in the stock location, camber (i.e., the degree to which the wheel tilts inward or outward when viewed end-on at ground level) increases as the suspension compresses and thus decreases the tires' contact with the road. That's fine for 2WD, but on a 4WD car, we must maintain maximum contact throughout suspension and steering travel, so move the shock-tower tie rod upward $\frac{5}{32}$ inch and inboard $\frac{3}{32}$ inch.

Now, let's look at the rear suspension. On Associated's old bulkhead, the top inboard hole is used for the tie rod. If you have Associated's RC10 graphite rear bulkhead, you

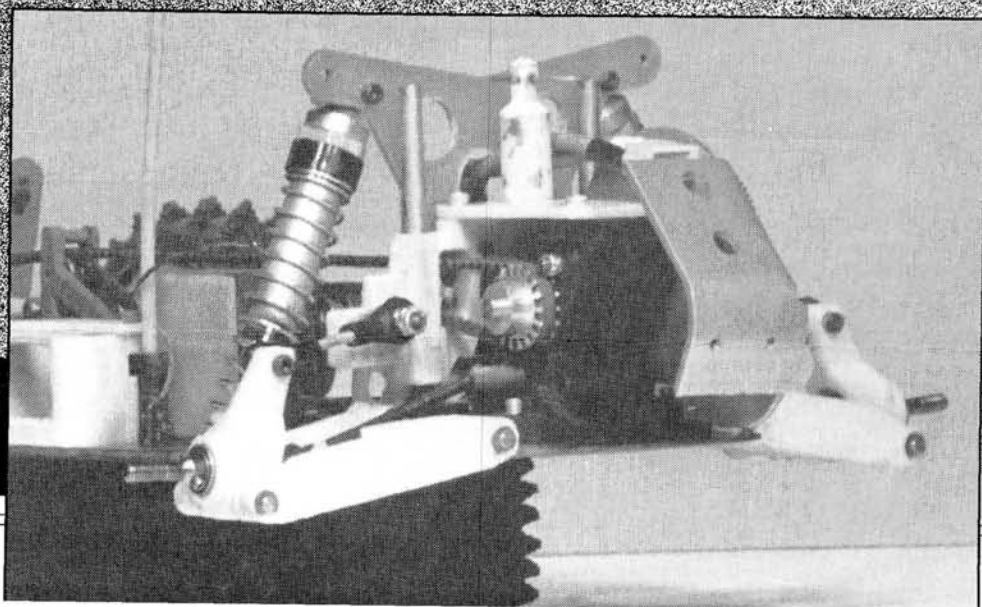


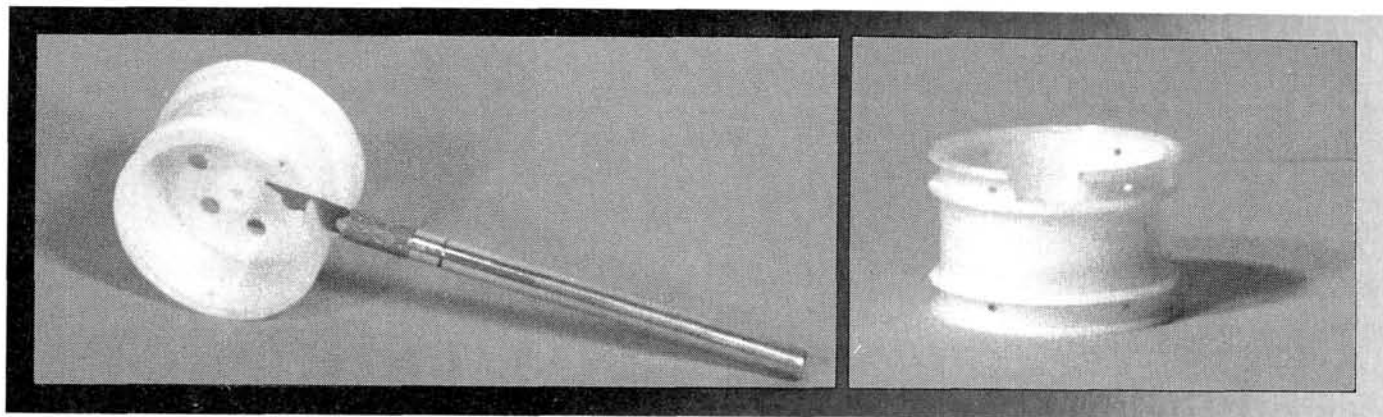
Reverse the position of the belt guide, and move it aft $\frac{1}{29/32}$ inches from the location shown in Part I.

For belt-pulley clearance, remove the MIP logo from the transmission housing.



MIP's rear transmission, complete with GD100 gear differential and TC100 torque-control unit.





When using narrow front tires, carefully cut $7/32$ inch off the outer part of the rim.

might want to put the tie rod at approximately the same height, but in line with the wing tubes. This changes the rear-wheel camber when the suspension is compressed and affords very good road contact of the outside rear wheel as the car goes through a turn.

I used Associated's RC10 graphite rear hub carriers (part no. 6366) with Robinson Racing's* 3.5-degree rear suspension mounts (RRP2035). If you run on a high-bite track, this amount of rear toe-in might not be necessary. Try Robinson's RC10 adjustable rear suspension mounts (RRP2005) if you wish to experiment further.

For the front shocks, I used the second highest hole on the shock tower, and I put a $5/16$ -inch piece of silicone tubing on the lower shock shaft. (Gold springs with 40WT oil

work well here.) I mounted the rear shocks in the hole closest to the wheel in the stock A-arm, and on the shock tower, I drilled a hole $3/8$ inch inside and $5/32$ inch below the outermost stock location. This creates a more progressive spring rate, which improves the car's handling. I used stock pistons in both the front and rear shocks.

To prevent the rear dogbones from binding, I used three nylon spacers, two small nylon washers and one O-ring on the shock shaft inside the oil reservoir. You can buy these as Associated's shock rebuild kit (6467) or, better yet, rebuild your old shocks and use the worn parts for stoppers. Use a $5/16$ -inch piece of silicone tubing as a travel limiter on the lower part of the shock shaft. (I used gold springs and 30WT oil in the rear.) Don't

adjust the ride heights until the car is "race ready."

To increase the drive train's efficiency, move the belt guide backward $1^{29}/32$ inches from the location mentioned in Part I, and turn it approximately 180 degrees so that the MIP emblem faces the car's right side. To adjust the belt tension, either put washers under the belt guide, or insert pieces of piano wire under

the fore or aft section of the front transmission. If you choose the latter method, check the clearance between the forward belt pulley and the shock tower; you might need to trim the tower where they touch. Be sure that the forward belt-pulley hex screw is centered; otherwise, it could come into contact with the forward, left, outdrive hex screw.

Now for the rear transmission. The rear belt pulley intermittently contacted the raised MIP lettering on the left rear transmission housing. To allow clearance, I simply removed the logo with a Dremel tool.

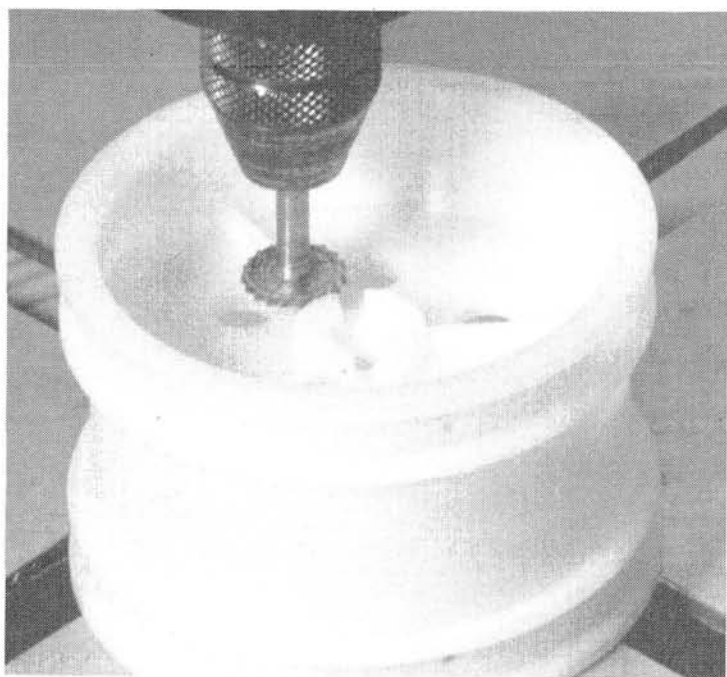
Next, I installed MIP's new gear differential (GD100) and torque-control unit (TC100). To accommodate the unit (TCU), drill an $11/32$ -inch hole in the upper left part of the transmission housing, and screw a small aluminum 4/40 Team Pit Stop* nut onto the TCU to ensure clearance between it and the drive belt.

If you don't want to install the TCU but still want to upgrade the rear transmission, try MIP's Super Pro Ball Diff (BR100). I also used Associated U-joint/dogbones (6371) with three spacers on the inside of the stub axle and one on the outside.

4/10 FOOTWEAR!

Originally, I used Associated TQ rims (6802) on the front and rear, but when I tightened the fronts excessively, they grazed the spindles. To avoid this unwanted friction, I substituted Pro-Line* rims (2519) and cut $3/64$ inch off the insides where the rims touch the spindles.

If you use wide tires, simply glue them onto the rims. If you use nar-



To reduce friction, cut $3/64$ inch off the inner part of the rim where it touches the spindles.

row tires, carefully cut 7/32 inch off the outside of each rim, using the inner ridge as a guide. When choosing tires, be sure the fronts and rears are of the same di-

ameter. I used Associated TQ70s (6870) up front and TQ20s (6820) in the rear.

If you use 7-cell batteries and/or your car is a little heavy in the rear, I recommend that you use an anti-sway bar. To minimize my 4/10's weight, I used aluminum hardware wherever possible (Team Pit Stop RC10 Lightening Kit no. 5000). With a 6-cell SCE battery and a modified motor, the car weighs 56.4 ounces.

For the body, I chose Associated's Protech II (no. 6173) because it's light, yet durable, and its aerodynamics contribute to the car's stable attitude in flight off jumps. I also used a Bud's* bi-level wing (5237). If you leave extra wire, you can compensate for a nose-high (or nose-low) attitude off jumps by simply moving the wing forward or backward. I chose JG Manufacturing's* RC10 Black Front Skid Bumper (A-02B).

Because of its battery-regeneration and torque-control capabilities, I decided to use Tekin's* TSC 411P speed controller (SC). To provide greater airflow and lower the car's center of gravity, I installed the SC on the chassis just aft of the batteries. Take the time to bench-test your car when you install the receiver; if it's mounted incorrectly, you'll have excessive glitching. I mounted my Novak NER-2S receiver on its side as far away as possible from the ESC and all the wiring.

Front toe-in and camber should be slightly inward. (*Caution: a little does a lot here!*) If your car's front end bites excessively and causes oversteer in turns, try using a tire with less traction up front or one with more traction on the rear. This should make the front push more in the turns

Front toe-in and camber should be slightly inward. (*Caution: a little does a lot here!*) If your car's front end bites excessively and causes oversteer in turns, try using a tire with less traction up front or one with more traction on the rear.

and give the car neutral steering. If it still oversteers coming out of turns, increase rear toe-in. Conversely, if it understeers through turns, try a tire with more traction up front, or

decrease rear toe-in.

When you've installed the motor, batteries, body and wing, adjust the front spring tension so that the tops of the A-arms are level when you drop the front end from a height of 4 to 6 inches.

Because the 4/10's motor is mounted in the rear, it receives more air and therefore stays cooler. Motor changes are also easier than with its mid-motor counterparts. The belt doesn't enter the transmissions, and this keeps dirt out of the tranny and minimizes the need to rebuild. Also, no belt covers are required, and that should put a smile on your face; after all, wouldn't you rather be driving than rebuilding?!

PUTTIN' IT TO THE TEST

I was hoping to tell you of an A-Main victory in my first track test, but I didn't finish the modifications until after the racing season had ended. I can tell you that the 4/10 raced more than two dozen times without any mechanical failures, and it qualified for the A-Main eight out of eight times.

The car's best run was 14 laps in 4:14 minutes with a 13-turn double-wind motor; it missed 1st place in the A-Main by only a fraction of a second! Other noteworthy runs were 14:15 with a 24-turn quad motor, 14:17 with a 14-turn double, and 14:17 and 14:18 with a 13-turn double. On the days I turned in those times, A-Main victories in 2WD Stock and Modified ranged from 13.02 to 13.15, with only one 14.21.

I decided to strap in a 17-turn triple motor and a 6-cell SCE and try to beat that 14:14! My first attempt

(Continued on page 167)

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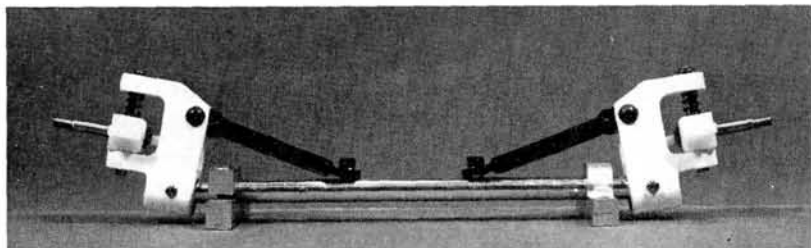
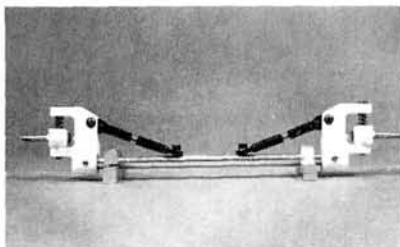
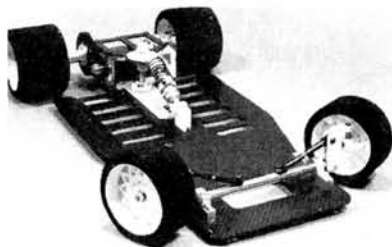
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PROJECT LYNX

(Continued from page 80)

(tungsten carbide) Hard Balls and a pair of stock diff rings. The TC diff balls are substantially harder and rounder than the stock ones, and this increases durability and smoothness of operation.

CHARGED CAT

For the Lynx II's electrics, I started with a Trinity Pushed SCE matched pack and Novak's* new 410-MXc regenerating speed controller (SC). This SC has new circuitry that will return part of the charge to the battery pack when it's braking or running at less than full throttle. The 410 also operates at a very high frequency, and this smooths throttle response and greatly reduces motor wear. A built-in torque-control feature is rather welcome when using cap tires, because it limits the power the motor can deliver off the starting line. This goes a long way to prevent tire spin when coming out of holes, or when leaving a turn.

For this oval assassin, I chose one of Reedy's* Ultra Series modified motors—a Mr. J's* 12-turn quad. According to its

(Continued on page 112)

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PROJECT LYNX

(Continued from page 110)

spec sheets, this motor was designed to be used in a 1/12-scale, 8-minute car, but from previous experience, I know it's a very strong 1/10-scale oval motor.

The motor is connected to the spur gear by a 23-tooth gear from TRC's line of hardened-aluminum pinions. These gears are precision-machined for smooth operation, and they're lighter than the standard steel pinions. This lightness doesn't significantly affect the car's weight, but it speeded up throttle response coming out of turns by very slightly reducing rotating mass.

To link all the electronic hardware, I chose what I think is the ideal radio for a car of this caliber—the Futaba PCM 1024. Granted, some less expensive systems would work well enough, but this system offers so much for highly competitive racing that it seemed to be the only logical (although expensive!) choice. The PCM's features are too numerous to describe thoroughly here, but rest assured, it conforms with my strin-

(Continued on page 115)

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PROJECT LYNX

(Continued from page 112)

gent standards for top-quality products. Hard-core racing enthusiasts might find the Futaba radio system slightly slower to respond (a couple milliseconds) than some other "megatransmitters," but for this application, this is insignificant.

I covered the lethal Lynx with an Andy's* T-Bird that has been detailed by Motion Graphics'* Richard Muise, who's considered to be one of the most talented painters of R/C car bodies. The paint scheme replicates that of Bill Elliot's NASCAR car (my sentimental favorite) and a good look at Muise's work on my T-Bird should be evidence enough of his talent.

Finally, the wing; it's one of Tecnacraft's latest releases, and it's formed in the shape of an actual airfoil. The wing is available in 5- and 7-inch lengths, but from my experience, I know that even the smaller Tecnacraft craft wing can produce more downforce than the larger, flat wings.

(Continued on page 128)

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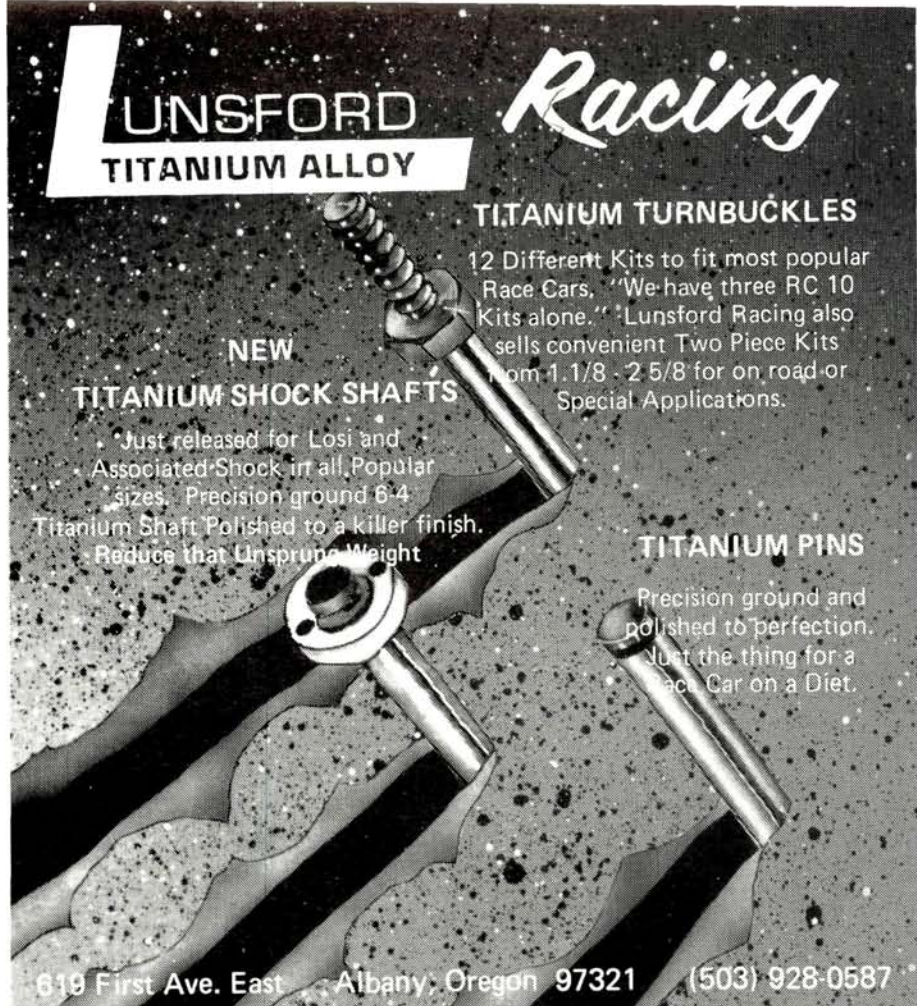
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MISS BUDWEISER



PHOTOS BY RICH URAVITCH

IT'S NO REAL SECRET!—all my buddies know it. When push comes to shove and I have to state a preference for a particular type of boat, I like scale!—more accurately, I like fast scale. No matter whether it's electric, glow, or gas motivated, if it looks and performs like a real water boiler, I like it. To my way of thinking, nothing conveys the feeling of awesome power more than the ear-splitting, slam-you-against-the-canopy, nearly airborne ride of the unlimiteds; and the “ultra-awesomes” of this group have to be the jet-powered water wonders that rocket along, apparently being chased by a steam cloud. It doesn't get any better (or faster!) than this!

by RICH URAVITCH

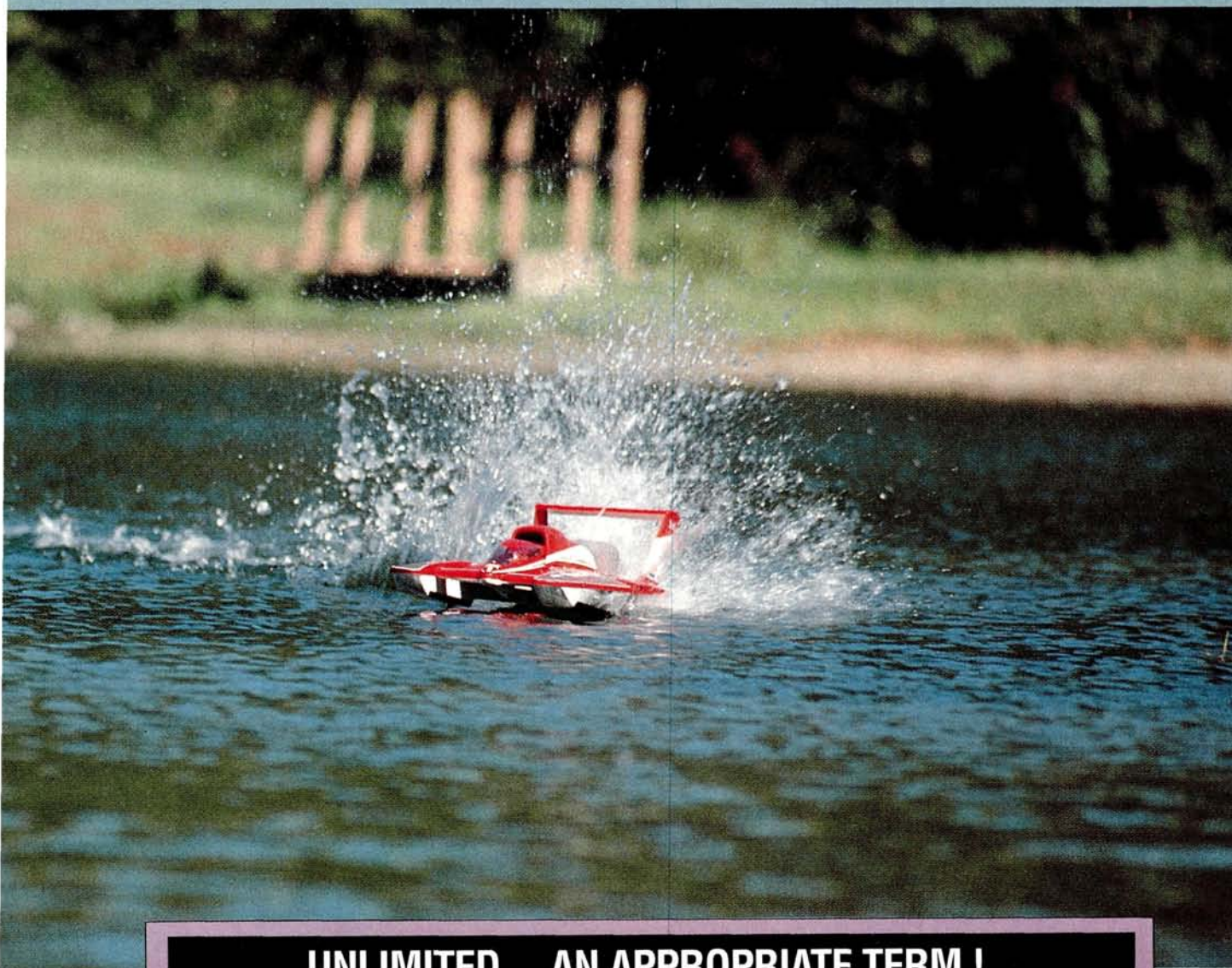
It was only natural that I gave MRP's Unlimited*

hydro—Miss Budweiser—more than just a passing glance when it was introduced. It combines many features that would appeal to a lot of modelers: it's electric powered, so a couple of spare battery packs will allow you to run almost constantly (you could recharge one set while running the other); its size makes it easily transportable and operable on smaller ponds; it's quiet; it needs no tuned pipe for maximum performance; it looks attractive; it's easy to assemble; and it's moderately priced. Made sense to me!

THE KIT

MRP offers the Miss Budweiser in a variety of built-up “stages.” I chose the “Ready-to-Run” (RTR) since, at

(Continued on page 126)



UNLIMITED... AN APPROPRIATE TERM !

Miss Budweiser; Mr. Pringles; Circus Circus; Miss Stroh Light; Oh Boy Oberto!—some interesting names for some of the wildest, most powerful full-size water rockets to blast over the pond. They all run in the Unlimited category of the American Power Boat Association (APBA), and these 3-ton monsters, which are capable of speeds right at the 200mph mark, are among the most impressive around.

The "Unlimited" category is appropriately named, because the only thing that's limited is the length of the hulls. Virtually anything beyond that goes! Many of these machines owe their existence to things with wings; most of them are powered by airplane engines, from the famous Rolls-Royce Merlin and Griffon engines of WW II to the kerosene-burners like the G.E. and Lycoming turbines that once resided in the engine compartments of some of Uncle Sam's hellis.

Now what else might qualify them as Unlimiteds? Take a look at the sponsors' budgets for racing and maintenance! *No one ever said fast came cheap!!*



MRP MISS BUDWEISER

(Continued from page 125)

the time, I was really more interested in running than assembling. The instructions are identical for all versions; they just start you at different points, depending on which kit you bought.

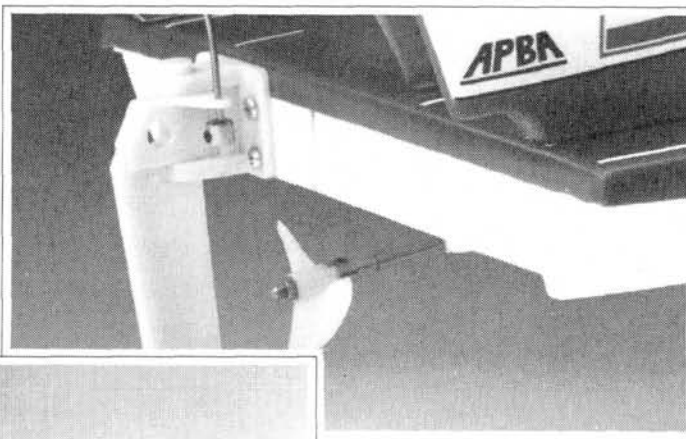
The hull is of vacu-formed polystyrene that's molded in two pieces: the upper surfaces in red, the lower in white. My hull had been joined at the factory, and the sponsons had foam flotation blocks already installed. The assembly of these two components is clearly discussed in the photo-illustrated instructions, which also stress the need to adequately waterproof/seal the joint.

BUILDING THE BUD!

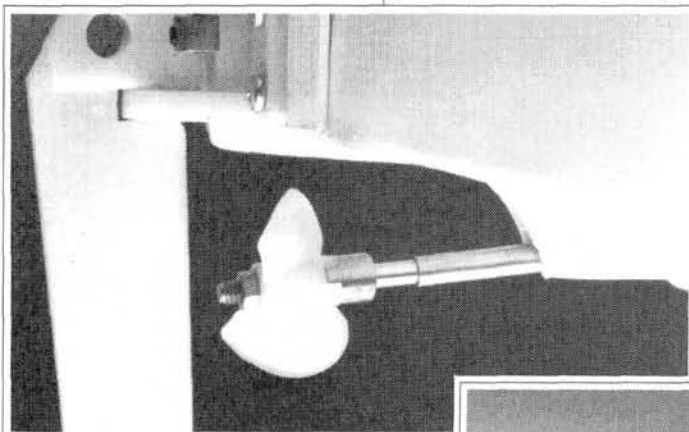
I joined the rear horizontal and vertical stabilizer parts before attaching them to the hull. I used Zap* CA for this, and I used the supplied sheet-metal screws to attach the assembly to the hull. It was starting to look like a great boat!

The cockpit canopy is vacu-formed of clear polycarbonate, and to retain a scale appearance, the part over the driver had to be painted red to match the hull. I chose Testor's* enamel, and it matched almost perfectly. Before attaching the canopy, I painted the details onto the cockpit and pilot figure. The only piece that still had to be attached was the removable cowl, the rear portion of which I masked and sprayed with Testor's Silver to simulate the jet tail-pipe shroud of the full-size boat.

Finally, I attached the sponson sharpeners, or "ride pads," as MRP calls them. These are supplied, and MRP recommends that you use them. They restore a sharp edge to the sponsons, and this is necessary for good handling. (This edge is lost in the



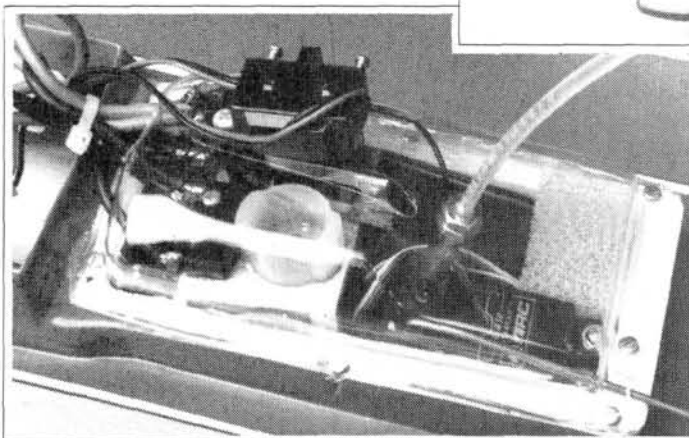
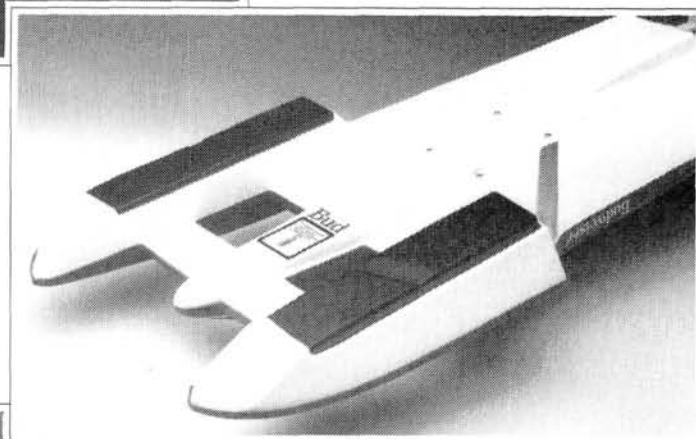
Above: The stern shows the offset rudder installation and the prop. The rudder area is large enough to provide accurate steering, despite some loss of motion caused by the 90-degree bend in the wire.



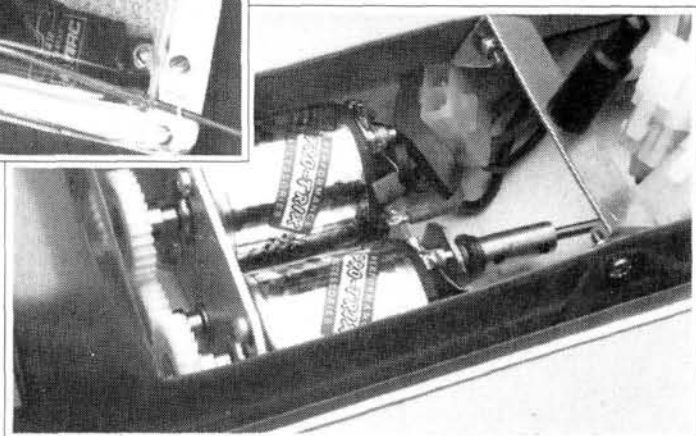
Left: This close-up shows the Octura prop drive dog that eliminated prop slippage when the "double-nut" method was used.

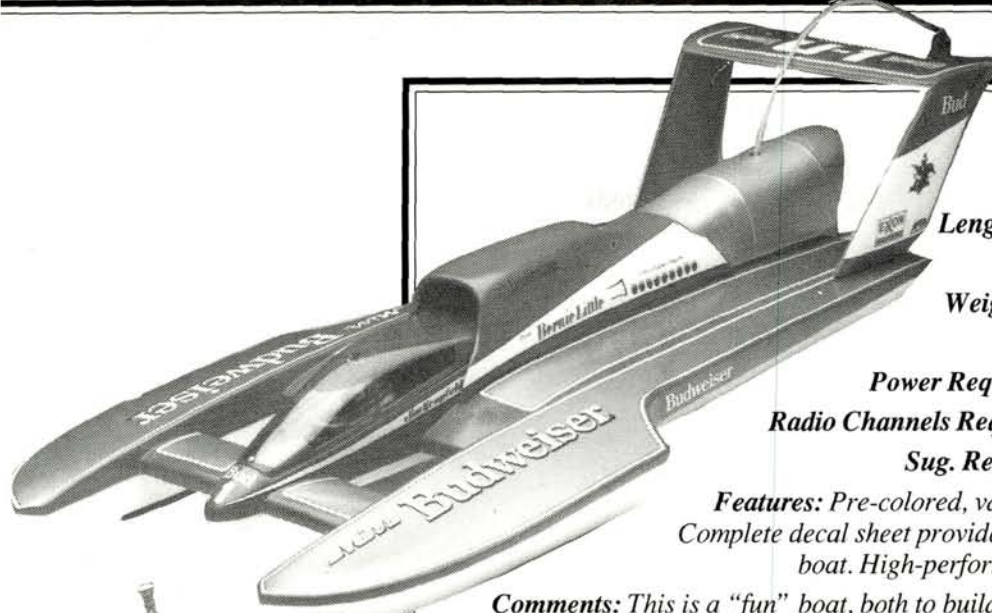
Right: The bottom of the sponsons after the addition of the "ride pads," which sharpen the edges and thus improve handling and tracking.

Below: The radio box has enough room horizontally (but not vertically) for standard-size equipment. The watertight seal made with bathtub silicone sealant was made ineffective by the cuts that had to be made in the cover. (These were necessary to provide clearance for switches on the speed controller.)



Below: Twin Pro-Trix motors gear-driving a single shaft deliver terrific power. Proper break-in is important (see text). The cowl hold-down bracket pivots to allow access to the battery packs.





SPECIFICATIONS

Type: Electric unlimited hydro

Length: Hull, 24.5 inches; O/A, 28 inches

Beam: 13 inches (at sponsons)

Weight: 4 pounds, 9 ounces, ready to run

Hull Material: Vacu-formed plastic

Power Req'd: Twin electrics/gearbox (supplied)

Radio Channels Req'd: 2 (steering and speed controller)

Sug. Retail Price: \$239.95 (Deluxe kit, RTR)

Features: Pre-colored, vacu-formed hull requires no painting. Complete decal sheet provided to help you duplicate the full-scale boat. High-performance; twin drive system is included.

Comments: This is a "fun" boat, both to build and to operate. It delivers scale-like performance and, typical of its type, is more suited to running on smooth water than in mild chop. The waterproofing of the radio compartment depends on the size of the components used; we couldn't get everything into the allotted space without cutting away some of the cover.



Left: The MRC two-stick radio (on surface frequency, naturally!) was used in the Miss Bud—good, reliable equipment.

vacu-forming process, because the thickness of the plastic being formed produces a round, rather than a square edge.) Although I didn't try

Miss Bud with and without these additions for comparison, I'm sure that they do exactly what they were designed to do.

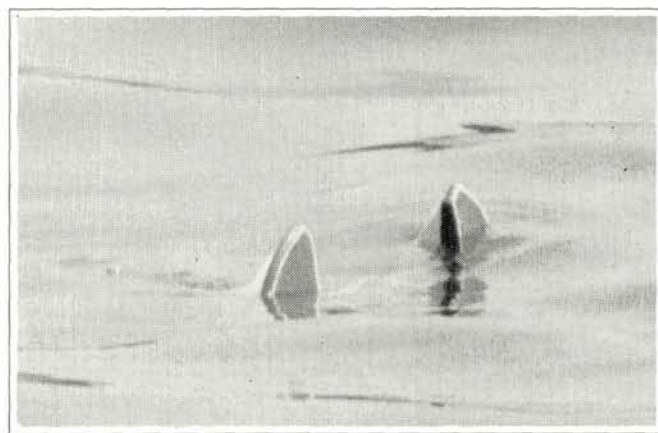
Since the twin Pro-Trix motors and their drive systems were already installed, I next had to install the radio system, which included a speed controller. I use a two-stick MRC* system with two standard-size servos. I decided to keep the separate battery pack rather than opting for a system equipped with a BEC (Battery Eliminator Circuit), which would draw power for the radio system from the packs that power the propulsion motors. There's a slight weight penalty, but I didn't think it would adversely affect the Miss Bud's performance (and it didn't!).

The radio compartment is at the aft end of the hull, and it will accept most equipment, but it's a tight fit. The compartment bottom is integrally molded in the vacu-forming process, and it's covered by a clear, formed cap that's held in place by small sheet-metal screws. I used silicone sealant to make a "form-in-place" waterproofing seal. (I did this *before* I mounted all the equipment in the box.)

When eventually installing the electronics, I discovered that, regardless of all the juggling, repositioning and cussing, I couldn't make the cover fit over everything. The speed controller's microswitches prevented the cover from returning to its previously neat, watertight location. The only solution was to cut clearance holes in the cover, and I resigned myself

to the fact that if water came over the sides, it would get into the radio. If water came in, it would also get the propulsion batteries that were on the bottom of the hull—even lower than the radio box!

The rudder pushrod is a short, simple wire affair; the 90-degree bend to make the connection to the rudder allows some flexing and slightly reduces steering sensitivity. The rudder assembly itself is of molded nylon, and it's attached to the



A split second before visiting the bottom! Additional flotation will be injected into the sponsons. The radio was allowed to air-dry; the batteries were recharged; and we were soon running again!

transom by four sheet-metal screws. It has a plastic shear pin that will allow it to hinge upwards if the boat hits something while running forward—but not backward. (More about that later!)

Using the recommended double-nut method (with a drop of CA "to prevent freewheeling"), I attached the prop to the shaft.

(Continued on page 174)

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PROJECT LYNX

(Continued from page 115)

ONE COOL CAT!

When I tested the Lynx, I didn't have any surprises; it performed exactly as I suspected it would. It's much more aggressive through turns and more able to carry its speed than ever before. The oval chassis did what it was designed for—turning left—but fitting all the battery cells on the left side means that battery weight on the front end is increased. As a rule, this will increase steering sensitivity, which isn't exactly what you want at very high speeds. Knowing this, you can take steps to compensate for it—exactly *how* much will depend on track conditions. If you're attempting a project of this caliber, you're experienced enough to know how to make the necessary adjustments.

I found that there's a point at which the oval chassis produces handling problems. As the angle of the banking increases, the benefits of this chassis configuration are quickly erased. On a track with higher banking (more than 20 degrees), downforce in the turns applies too much

(Continued on page 134)

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PROJECT LYNX

(Continued from page 128)

weight to the inside of the chassis. This will make the outside wheels light, which you rely on for most of your cornering ability. For tracks like these, I recommend that you use the standard chassis with a five-and-one or four-and-two battery setup.

The new front end turned out to be a convenient aid to tuning, but I'm not so sure it's absolutely necessary. It saved me the trouble of having to fish through the many suitable fixed and split axles to determine which would work best on a given track, but for oval racing, I don't think the increase in bulk is worth the extra expense (roadcourse racing is a different story). If you're already winning at the probable cost of this project, you can surely do without the front end.

I don't recommend this project for average enthusiasts. Some of the components I use would make your car easier to drive on certain tracks, but the emphasis must be on driving skill, and you can't buy a part good enough to compensate for the absence of this. But once you've reached the point where you're running with the best of 'em and it's an inches game, these mods can keep the competition in your rearview mirror!

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SCHUMACHER COUGAR

(Continued from page 77)

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(Continued on page 152)

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SCHUMACHER COUGAR

(Continued from page 134)

configuration, and these packs won't fit either way. Fortunately, Schumacher has the three-and-three saddle-pack holder, which uses quick-release battery straps,

so I can use my matched cells after all.

I chose the new, high-frequency Tekin* ESC 700 speed controller. Apart from its awesome, power-handling capabilities, it's very smooth and easier on the motors and batteries than most others. At the receiving end of the 700 is a Joel

Johnson Silver Dot modified, which is a 17-turn triple wind that has been proven very effective in 2WD modified racing.

The final step was to add some color to the body. After applying the pre-cut window masks (a welcome addition), I gave

(Continued on page 160)

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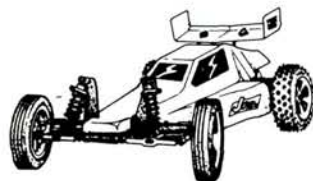
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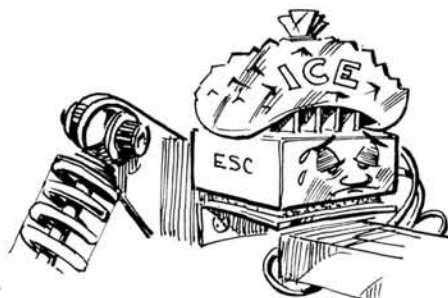
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TROUBLESHOOTING

Illustrations by JIM NEWMAN

by STEVE POND

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



KEEP IT COOL!

Where's the best place for an electronic speed controller on a JR-X2? I have a Novak T-4 ESC that's mounted on the rear shock tower, but I think it's being subjected to some motor noise. I want to keep it as cool as possible.

What's the best motor wind for a medium-size track with a lot of small turns?

Robert Hess
Memphis, TN

The shock tower is a pretty convenient location for a speed controller, but when it's mounted flat on the chassis, cooling is better. Motor noise won't bother an electronic speed controller; it only bothers the radio's receiver. As for the motor, other variables determine what your "ideal" motor would be. If you run fairly good 6-cell packs, a motor in the 12- to 15-turn range would give plenty of power. For 7-cell racing, try 14- to 18-turn motors. The track's surface should tell you which motor in the recommended range you should choose. For slippery, hard-packed tracks, I prefer a motor with more turns; for soft, high-bite surfaces, you can get down into the heavy hitters.



TIGHTENED TO DEATH...?

I recently bought an RC10. When I ran it a few days ago, it suddenly stopped dead. Even though the motor ran, the car wouldn't go anywhere. I took out the transmission, and found that the spur gear was spinning, but the drive shaft was staying put. I rebuilt the transmission several times; I even took out the diff balls, wiped off the diff grease and tightened the diff nut extra tight. Should I get a Hyperdrive or Lethal Weapon transmission instead? Please help!

Daryl Nowak
Calabasas Hills, CA

Before you throw money at your car, grab your instruction manual and go through the section on transmission assembly step by step until you determine what the problem is. It sounds as if the problem is with the upper shaft of the transmission.

The diff tube (as it's called in the instruction manual) must have a gear pressed onto the end during assembly. It's possible that you didn't press this gear far enough onto the tube, and it has worked itself loose. Another possibility is that the D-shaped hole in the outer diff-ring carrier has been damaged. This D-shaped hole in the carrier matches the shape of the diff shaft (which has a flat side), and if it's ruined, the car won't move.

The Hyperdrive conversion and the Lethal Weapon transmission are certainly good choices if you've decided to try something different, but don't give up on your stock tranny. It will work very well when it's properly maintained.



HITS AND QUILTS!

When I lift the rear of my RC10, it functions normally, but when I put it down and run it at top speed, it goes out of control. It goes straight at full speed until it hits something, but when I pick it up, it stops. It has a Reedy Gold Star, a Novak T-4 ESC and a stock transmission and ball bearings. I've adjusted the ESC about 5,000 times, but the car still has the problem. A friend of mine uses a Futaba MC 112B in his RC10 (which also has a Goldstar, ball bearings and the stock tranny), but his runs perfectly. What should I do?

Son Nguyen
Lancaster, PA

Your problem is a momentary loss of power to the receiver. The BEC in the speed controller is calibrated to supply the required voltage to the receiver when you're using a 6- or 7-cell battery. A motor as powerful as the Reedy Gold Star consumes most of the available battery power. This reduces the voltage being supplied to the receiver to less than that required for proper operation. The result is exactly what you describe.

To solve this problem, you have a few options:

- Use a "stutter stopper." Available from Novak Electronics, a stutter stopper is a capacitor that builds up a charge and supplies the receiver with power when the speed controller isn't able to. It will supply power for 4 to 6 seconds, which should exceed the length of the power loss to the receiver that results from hard acceleration with a hot motor.

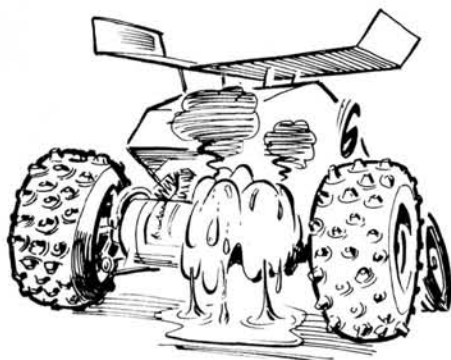
(Continued on page 158)

TROUBLESHOOTING

(Continued from page 156)

● **Connect the BEC bypass wires on the speed controller to each other.** These wires, which exit the speed controller near the receiver plug, were designed to be used when racing a 4-cell, 1/12-scale car. Four cells provide just enough voltage to power the receiver. If the power is first passed through the speed controller, the BEC will reduce it to below the required voltage. The wires coming out of the speed controller enable you to bypass the BEC unit when there's no need to reduce the voltage. It's now common for racers to connect these wires even when they run with six cells. The additional power supplied to the receiver compensates for the power lost under heavy acceleration.

● **Install a 5-cell receiver pack to power the receiver.** These packs are very small, so they don't increase weight much, and they'll get you through a day of racing without a recharge.



PLASTICMELTICUS!

I own a JR-X2 (with the Pro kit) and a JR-XT, and I'm happy with their quality. My problem? They both consistently melt the diff gear (part no. A-3006)—not just once, twice, or even three times, but at least six times...and still counting. I follow the instructions, paying careful attention to the correct order of installation and lubricant application. I can recite in my sleep the section in the manual that describes the correct diff adjustment. I've updated my JR-X2 with the heavy-duty thrust bearing included with the Pro kit, and I did

the same for my JR-XT. I've even assembled the transmission with the recommended Hard Balls (part no. TL-4016), but I still suffer from terminal meltdown. I race somewhat competitively (locally) using stock motors, gearing used by others with similar setups, and 6-cell SCRs. I also maintain my cars meticulously.

I've only met two people with similar problems. One suggested that I was buying bad stock, so I bought diff gears at a different shop, but to no avail. The other suggested that there's a certain way to install the diff gear in relation to the thrust-bearing adjustment screw. I've tried putting the gear both ways, but I still suffer from "plasticmelticus."

I still believe in Losi and think it has a wonderful product, but why am I plagued with this when others aren't? I await your diagnosis.

Carl N. Ringness
Medicine Hat, Alberta, Canada

The only cause of gear meltdown in the Losi transmission differential is too much diff slippage. With the diff rings sliding on the diff balls at 5,000 to 10,000 rpm, you can imagine how fast heat will build up in the transmission. This heat softens the plastic gear and eventually leads to meltdown.

Follow the guidelines in the instruction manual to get your diff adjustment in the ballpark, but pay close attention to the part that says, "Fine-tuning will vary, depending on track conditions." To adjust the diff properly and avoid gear meltdown, put your car or truck on the track and apply full throttle. The initial setting should be loose enough to allow the diff to slip; if it doesn't, you won't know whether it's too tight or properly adjusted. Tighten the diff a little at a time (not more than one-eighth of a turn each time), until there's very little or no slip under heavy acceleration.

If you allow the diff to slip excessively to compensate for too much horsepower or an erratic throttle finger, you're heading for disaster—as you've discovered. I

recommend that you use a milder motor, practice applying the throttle smoothly and, if necessary, use a slipper clutch to tame your motor's power.



SMOKIN' MOTOR

I love my Team Losi JR-X2. It has a Reedy Competition Stock motor, but the motor bushings wore out, and now there's too much play in the armature. The armature rubs the magnets and doesn't produce max rpm. I bought a Speedworks Superspeedway motor, which is fantastic. I decided to rewind my Reedy, and at the same time, I took out a few winds. (I had heard of people doing that.) In a way, I succeeded: the motor runs more slowly, but it smokes like crazy. Why does taking a few winds out do that, and if I rewind it, will it work?

Steve Libretto
Mattituck, NY

I don't recommend that anyone try to wind or rewind an electric R/C car motor. Winding a motor isn't just wrapping wire around an armature, and it's best to leave this to the pros. When you take wire off an armature, the insulating varnish cracks. When you reattach the wire to the commutator, there's a good chance that two sections of bare wire will touch each other and create a dead short. This will cause the wire to heat up and smoke or burn. If your motor's armature is hitting the magnets, it's fair to say that you've had a lot of mileage out of it, and it's about time to buy a new one.

160

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2nd Place.....Top Fuel DragsterMike RussoAstro Top Fuel I Motor
2nd Place.....Unlimited DragsterRoger RoseAstro Top Fuel II Motor

NR/CTPA World Championships Champaign, Il. Sept. 30, 1990

1st Place.....2WD Modified.....A. JanickiAstro Pullmaster I Motor
2nd Place ...2WD ModifiedDutch EsagroAstro Pullmaster I Motor
3rd Place2WD Modified.....David Hester ...Astro Pullmaster I Motor
1st Place.....2WD Open IKyle Haynes.....Astro Pullmaster I Motor
3rd Place.....2WD Open IMarcia Arman Astro Pullmaster I Motor
1st Place.....2WD Open II.....Jim Bee.....Astro Pullmaster II Motor
2nd Place.....2WD Open II.....Scott Weigel.....Astro Pullmaster III Motor
3rd Place ...2WD Open II.....G. KinseyAstro Pullmaster II Motor
1st Place.....4WD Open ISean CullenAstro Pullmaster I Motor
2nd Place....4WD Open IDon Fisher.....Astro Pullmaster I Motor
2nd Place ...4WD Open II.....Dale ArmanAstro Pullmaster II Motor

Team Astro 13311 Beach Ave. Marina Del Rey, Ca. 90292 (213) 821-6242

NR/CTPA WORLDS

(Continued from page 104)

In the Modified Class, Greg Pierce and Kevin Florence put on a good show for 1st and 2nd, with runs of 4.33 and 4.51 seconds, respectively.

The Four-Wheel-Drive Stock Class saw Connecticut teammates Vincent Gamache and George Gendron duke it out for the top honors: Gamache's Clod Buster took the honors with a 4.70, and Gendron made a 4.82-second pass. Joe Kirkwood rounded out the top three with the only other run of less than 5 seconds (4.98).

In the Limited 4WD Super Stock Class, South Carolina's Bruce Kenney beat Mike Dozier and his Optima Mid for the top spot, and Ron Crawford (4.01) and James Price (4.22) closed out the field.

In Four-Wheel Modified, John Stokes led the way with a Kyosho Mega-powered USA-1 and a time of 3.54 seconds. Joe Kirkwood took 2nd place with a 3.54-second pass, and he was followed by Greg Markowski with a Clod Buster and a time of 4 seconds flat.

The Open Truck Class saw some really close, fast racing. The fastest run of the day was made by Ron Walls' Ultima conversion—a ballistic run of 3.03 seconds. Ed Avery's JR-XT managed a very competitive 3.05-second run for the runner-up slot, and George Ruff took the bronze with a 3.06-second effort.

Five monster tanks answered the call, and one in particular put in a very impressive run: Mark Fernando's Trinity-powered Blizzard tripped the lights after 3.65 seconds. Mike Kellner's Blizzard took 2nd with a run of 4.96 seconds.

CLOSING

When the final pull-offs had been made and the trophies awarded, the 1990 Worlds was history. Apart from the event's obvious growing pains, participants seemed to be happy with the results. Dave Sproul and his gang labored through a long and difficult weekend and handled everything well under the circumstances. Congratulations to all the entrants and sponsors who put their best wheels forward to give us an exciting weekend. This rapidly growing side of the R/C hobby promises to get even better. ■



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4WD RC10, PART II

(Continued from page 109)

was an utter washout. Unfortunately, I hadn't foreseen the need for pontoons—the track was water-logged!

One week later, the track was dry, and the 4/10 was ready to rumble. The timekeeper gave the signal, and we were off! The first two laps were high 16s; at that pace, I thought we could be looking at a 15-lap run. With seven laps completed, the timekeeper called, "Two minutes." Still looking good! At the 3-minute mark, the battery began to fade. Oh no—not overgeared again! Four minutes had gone by (with 13 laps completed). As the car crossed the finish line, the timekeeper called, "Thirteen." The 4/10 had beaten that 14.14 by a full second!

A 1-second difference wasn't enough for me, though. While the motor was cooling, I changed to a pinion gear with one less tooth. Moments later, the car was back at the starting line. Again, the first two laps were 16s. The 4/10 was running *great*—with no over- or understeer. It went to the inside or outside of every turn with equal precision and made a beautiful four-point landing after every jump. This time, when it was all over, it had clocked a low 14.08—surpassing that 14.14 by .6 second!

It was a pleasure to build, modify and test this car, but a fellow driver asked me if it was *really* worth it. Well, if you enjoy working on cars, you already own an RC10, and you want something a little more exotic than a store-bought 4WD car, I say, "Yes!" If you decide to try this project, too, but have questions, please write to me c/o R/C Car Action.

*Here are the addresses of the companies mentioned in this article:

Associated Electronics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

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Hyperdrive Racing Systems, 3210 Howard Nickell Rd., Fayetteville, AR 72703.

Robinson Racing Products, 165 N. Malena Dr., Orange, CA 92669.

Team Pit Stop, 12233 SW 132nd Ct., Miami, FL 33186.

Pro-Line, P.O. Box 456, Dept. C, Beaumont, CA 92223.

Bud's Racing Products, 52435 Rte. 113, Wakeman, OH 44889.

JG (John Gudvangen) Mfg., P.O. Box 6014, Whittier, CA 90609.

Tekin Electronics, Inc., 970 Calle Negocio, San Clemente, CA 92672.

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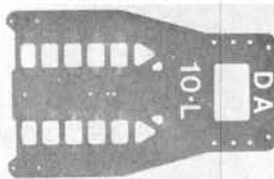


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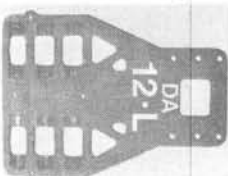
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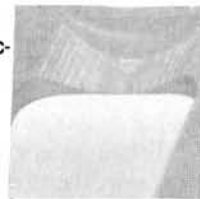
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SCOPING OUT

by JOHN RIST

Tekin's ESC 700



- high-frequency motor output
- built-in pulse checker

It comes complete with an instruction manual, filter capacitors, dust plugs, tie-wraps and an adjustment screwdriver.

TORQUE CONTROL

Two of the features listed—torque control and high-frequency motor output—are new “buzz words” in the ESC world. Torque control, or “punch control” as it’s sometimes called, is

adjusted by a third pot that’s on the face of the controller next to a test point. By measuring the voltage at the test point and adjusting the torque control, you can limit the maximum current that the ESC 700 provides. This might seem counterproductive: why spend big bucks on a hot-performing ESC and then limit its performance?

Torque limiting works as a damper on uncontrolled, wheel-spinning acceleration. A motor pulls huge amounts of current when you first jam the pedal to the metal. It takes time

for it to reach full rpm, and during this stage, it’s under a heavy load. To understand this principle, consider the excessive current that a motor pulls when there are binding gears, gearing that’s too high, or any malfunction that jams the motor. There should be a current-limit setting that’s low enough to stop spin-outs on a slippery track, yet high enough to permit full, top-end rpm.

HIGH-FREQUENCY MOTOR OUTPUT

Electronic speed controllers have been around for about 15 years, and the first ones were built by small companies that were looking for a product that worked, not the *optimum* solution. Sixty cycles per second (cps) was the speed at which most early R/C systems updated the information that was being transmitted to the car, and it was easy to design and build a speed controller that pulsed the motor accordingly.

From the start, people knew that 60cps switching caused arcing and sparking of the brushes and hurt the controller’s slow-speed smoothness, but a 60cps ESC was still much better than a resistor controller, and it

I RECENTLY TESTED a group of controllers for *R/C Car Action*’s “Monster & Racing Truck Special.”

I wanted to find out whether any could survive the brutal treatment of an Open I or Open II Class puller. One gem turned up—the ESC 700, Tekin’s* flagship electronic speed controller (ESC).

The ESC 700’s 14-cell rating places it in the range of the Open I pulling class. This, coupled with its low resistance rating, torque control, high-current capacity and smallness might make it the only controller you need for all your racing and pulling needs.

The ESC 700 is an all-out, racing-style (i.e., forward only with brake) speed controller. It has no connectors, and its large-gauge monster wire is capable of handling enormous currents. (As I’ve said many times, Tamiya-style stock connectors don’t hack it in the real world, and it’s a waste of money to supply them with a racing ESC.) The ESC 700 also has these features:

- nine FETs (eight forward and one brake)
- 4- to 14-cell capacity
- torque control

THE “SCOPING OUT” LAB

John Rist’s lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V, 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller’s output and to guarantee that it’s fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors, which can be switched on and off one at a time to vary the load between .6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current meter’s reading can be double-checked. Of course, the lab power supply provides the test current.

became the standard in the R/C racing world.

The ESC 700 addresses the problem of switching speed, but it's not a pure high-speed switching controller like its brother, the ESC 410. When you look at the ESC 700's output on an oscilloscope, you can still see the transmitter's basic 60cps frame rate, but this wave form is then chopped at a high switching rate. This combination of switching rates isn't quite as smooth as that of the ESC 410, but it's a big improvement on the standard 60cps controllers.

A LOOK INSIDE

I removed the four screws from the bottom of the controller and took off the case. Like the other Tekin products I've looked at, the ESC 700's quality is good. Tekin uses all of the tricks of the trade, including bent FET leads and heavy solder bridging to ensure a very low "on" resistance. There are some parts and a jumper wire on the back of the printed-circuit board, but their position seems to be the result of having to cram a lot of electronics into a very small package. The monstrous, 13-gauge silicone wire is also very nice.

Good looks are great, but does the ESC 700 have what it takes to perform well in a purebred racing machine? Tekin's 4- to 14-cell rating earned the ESC 700 a place in the select group of speed controllers reviewed in the 1991 *R/C Car Action Monster Truck Special*. As a result, I tested it at higher levels than I usually use for "Scoping Out." It took all the abuse and survived!

I conducted three tests—the resistance test, the "let-it-cook" test and the 90A dead-short test—and I added a few torture items (e.g., a 12V car battery to run the voltage-drop and "let-it-cook" tests). I also used four 7-

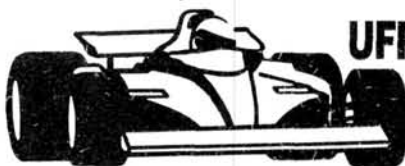


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Height 0.75 inch
Width 1.50 inches
Length 2 inches
Weight
(with wires) 2.4 ounces

TUNING:

Access to controls Excellent
Ease of adjustment Good

PRICE:

Suggested retail \$200
Warranty 120 days

ELECTRICAL:

(Manufacturer's specs)
Max. voltage 24 volts (14 cells)
Min. voltage 5 volts (4 cells)

Max. current 1890 amps
Continuous
current 480 amps
Resistance 0.002 ohm

TEST PARAMETERS:

Voltage 12 volts
Current 20 amps
Voltage drop to
end of wires 0.16 volt
Voltage drop
at 2-inch point 0.07 volt
Resistance to
end of wires* 0.008 ohm
Resistance at
2-inch point* 0.0035 ohm
BEC voltage
(6-cell pack) 5.06 volts

*Resistance = Voltage Drop ÷ Current

COMMENTS:

"Wow!"—that just about sums up my impression of the Tekin ESC 700. It's small, light, powerful and loaded with features, such as a 4- to 14-cell capacity that will make it work in everything from 1/12-scale cars to multi-motor monster trucks. The Tekin ESC 700 survived a 90A dead-short load while hitched to 14 cells, so it's virtually bulletproof. Although it doesn't include a heat sink, Tekin recommends that you use one if you're pulling more than 10 amps. (I advise you to buy a heat sink and use it.) The ESC 700 is truly a high-performance controller, and it should be a lethal weapon in any racing program.

cell, Ni-Cd packs in the 90A dead-short test—intent on destroying them!

To provide the short necessary to get 90 amps out of a Ni-Cd battery, I used about 25 feet of monster wire, and I tied the whole mess together with Sermos* Power Pole connectors. (These are the only connectors I know of that can handle 100 amps.) To measure the current, I used a 100W, .01-ohm, 1-percent resistor in series with the shorting wire.

First, I ran the voltage-drop test. In keeping with the ESC 700's high power-handling capability, I decided to measure the voltage loss across the controller at 20 amps, instead of the 12 amps I usually use. I used a digital voltmeter to take input- and output-voltage readings; the difference between the two gives the voltage drop across the ESC. If you know the voltage drop at a fixed current of 20 amps, you can calculate an ESC's resistance: resistance = voltage drop ÷ 20 amps.

I measured the voltage drop at two

points: from end to end on the battery and motor wires, including any connectors; and at the 2-inch point along the wires. The first reading is the voltage drop of the controller as it comes out of the box; the second is a standard measurement by which I can compare the controllers I test.

With the 12 volts applied and 20 amps of current flowing, the end-to-end voltage drop was .16 volt—an incredible .008 ohm. This low resistance is the direct result of Tekin's using eight FETs (instead of the usual six), and the generous size of the motor and battery monster wire. The voltage reading at the 2-inch point revealed a voltage drop of .07 volt for a resistance of .0035 ohm.

THE "LET-IT-COOK" TEST

With the 12V car battery attached and a 15A battery charger running full-bore, I readjusted the resistor load bank to consume 40 amps. The first attempt caused it to smoke a lot. At the higher currents, I had to direct

the blast from a 20-inch fan across the load bank.

Even though Tekin doesn't provide a heat sink with the ESC 700, I opted to run one because, in a Tempfet-style speed controller, it's important. Often, there's only one temperature-sensing FET; if it doesn't detect the heat, it can't do its job of "pulling the plug." After 15 minutes, the controller was very warm, but by no means dangerously hot. In fact, I doubt that it was even close to auto thermal shutdown.

Finally, I ran the dead-short test, which was intended to be the "acid test." The ESC 700 is rated for 14 cells and 480 amps continuous current; this means that it should handle all the juice a 14-cell pack can deliver. As a shorting device, I again used 25 feet of 13-gauge monster wire in series with a .01-ohm, 100W resistor. By taking voltage readings across the resistor, I was able to determine the current flow. I took current readings every 10 seconds for 1 minute. (I chose 1 minute because that's the time limit at most truck pulls). The initial current was a whopping 90 amps. At 30 seconds, the current was at 56 amps; it was 50 amps at 60 seconds, and the batteries were *smoking hot!*

I don't think that many hot-rodders achieve true 90A currents, because I literally wrecked my battery packs. I had smoke billowing and fire flaring! During the 1-minute dump, I melted all the shrink-wrap off the cells, and some of the cell-to-cell straps even shorted out across the edge of the pack. If you're going to abuse your Ni-Cds in the 100A range, do two things:

- First, put heavy braid between each cell. The extra metal helps to dissipate heat, and the low resistance of the strap improves performance.
- Second, put a high-temperature sleeve around each cell. Plumbers' Teflon sealing tape might work, or perhaps cardboard.

Even though the Ni-Cd battery packs were destroyed, the speed controller survived the tests in style. It was hot, but once again, not hot enough to go into thermal shutdown. I think the Tekin ESC 700 is up to the

task of Open I Class truck pulling, or any other type of serious racing.

CAR TESTS

It was time to mount the ESC 700 in my Bolink Eliminator Gold Edition and have some fun! I followed the installation diagram in the instruction book and had no difficulties. I used Sermos Power Pole connectors for the battery hookup, and soldered the motor wires directly onto the motor. Then, I headed out to the street where I dumped several packs through the controller.

Even though the ESC 700 isn't purely a high-speed switching controller, it's smoother than a conventional ESC. Its high-frequency switching is especially evident at low speeds, and it should extend the life of your motor. Running times were very good, and at the end of each run, the motor and speed controller were a lot cooler than I had expected.

Despite Tekin's recommendation, I wasn't using heat sinks, and I had the gearing so high that I was getting only 3 1/2-minute runs out of my 6-cell 1.2Ah pack.

Finally, I played with the torque control. It had been set to maximum, but for the last run, I set it to minimum. If you read "Scoping Out" regularly, you'll remember that the ESC 610 also had torque control, and that its current-limit range was so great that when I set it to minimum, the car ran very slowly (as if the battery were dumping). The ESC 700 doesn't have quite this range: at the minimum setting, acceleration is noticeably limited, but the top-end speed is still max.

I deliberately wet the tires of my Bolink and tried straight-line acceleration. With the torque control set to maximum, the car was "squirrely" and tended to "cut donuts." When I set it to minimum, the car became quite manageable, and straight-line acceleration was a snap. I think Tekin has picked a very useable range for its ESC 700's torque control.

(Continued on page 206)



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Hi-Frequency switching is much more efficient than frame rate switching, especially at lower throttle settings. Motor heating is greatly reduced, motor runs are noticeably longer, and throttle response is extremely linear.

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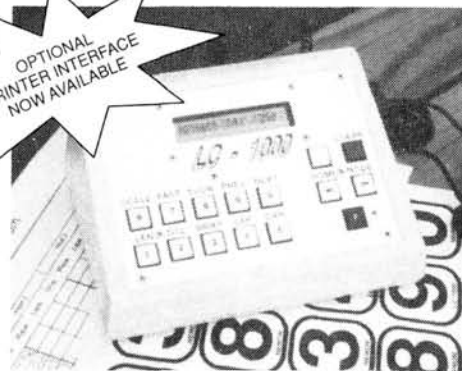
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MRP MISS BUD

(Continued from page 127)

As I discovered on the first run, this method
was less than adequate. The metal turn fin
was attached to the right sponson, and the
cowl hold-down post bracket was bolted
across the motor/battery compartment ac-
cess opening.

After that, I just had to install the twin, 6-
cell, 7.2V battery packs, and this was easy
to do with the supplied self-adhesive
Velcro® strips. Two Velcro® pieces, each
about 6 inches long, are installed in the
motor/drive compartment, parallel to the
drive shaft. There's also a 3-inch strip of
Velcro® on each battery pack, each ori-
ented across the pack. This allows you to
position the packs accurately in the hull,
i.e., in such a way that you can adjust the
center of gravity to suit running conditions.

I treated the motors to my standard break-
in procedure: I hooked each one up to a
fully charged, 1.2V, Ni-Cd D-cell and let
the cell run down completely. This non-
abusive method wears-in the brushes gen-
tly, allows everything to seat properly and
greatly improves the motors' performance.
Try it; I'm sure you'll see the difference.

BEAUTIFYING THE BUD

To complete the Miss Bud, I added all those
gold, black and white self-adhesive Mylar
decals. Before this, it had been just another
pretty red-and-white boat! The decals
brought it to life! The larger ones, e.g., the
big, gold, "Miss Budweiser" logo that runs
from the tip of the sponsons to the end of the
boat, should be handled very carefully.
Applying them "wet," as the instructions
recommend, makes the job a little easier,
but you should still take care.

BUD BASHING

Now we were really ready to run, so off to
the pond I went with Editor Steve Pond.
Everything seemed to be in order: the radio
and propulsion batteries were all fully
charged; we had a quick-charger and two
spare packs; we had the necessary cameras;
we had bright sunshine and a smooth-as-
glass pond.

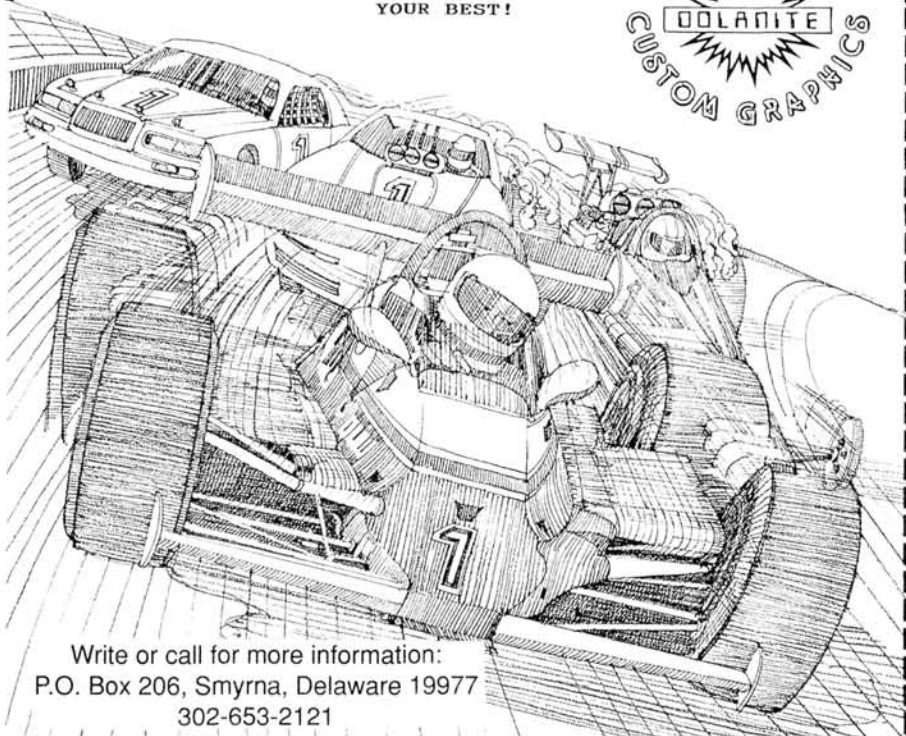
After taking some pictures of the boat
sitting in the water, we decided that it was
time...! Checking to see that the steering
was working in the proper direction, I slowly
advanced the throttle. Just behind the stern
of our little hot-rod, the water began to
churn, and Miss Bud slid forward—slowly
at first, then more decisively and, finally,
with authority.

Stay

AHEAD

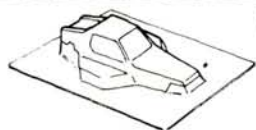
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Learn to make vacuum formed bodies & parts with your own oven, vacuum cleaner and an easy to make vacuum box, step by step plans & detailed instructions show you how. **Chapters include:**

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Plastics - types - sources - forming temps

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Send check or M.O. \$9.95 to: **Vacuum Form** P.O. Box 214318 Auburn Heights, MI 48321

MRP MISS BUD

As I approached the half-throttle mark, Miss Bud was itching for more power; I put the throttle stick to the wide-open position, against the stop, and the Bud bolted up on plane with the beginnings of a rooster-tail! It accelerated into, and then out of, the first right-hand turn, and it felt *great!* It had very

positive control!

It was just coming at us down the straight, when I detected a strange sound: the revs were still way up there, but Miss Bud had slowed nearly to a crawl. Obviously, something had let go. I managed to get it back to shore, where we quickly discovered the reason for the rapid—and drastic—change in performance.

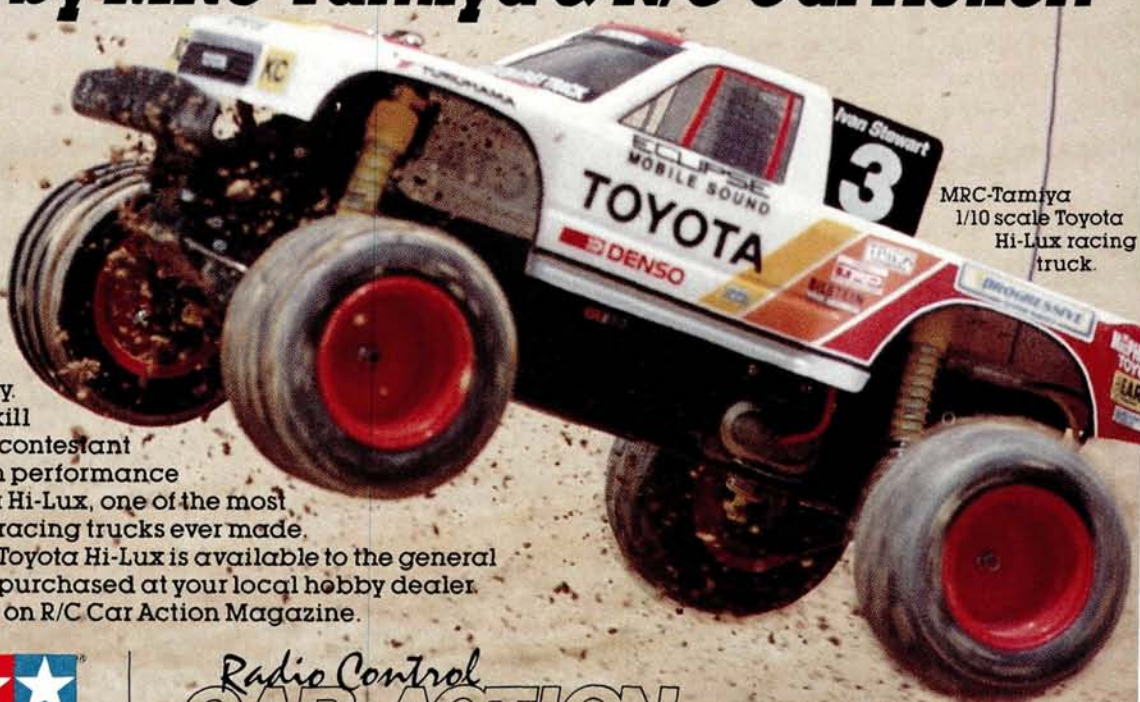
Remember the “double-nutted” and “CA’d” prop installation? Forget it! It might work, but our experience says it won’t work for long. Running was over for the day, but what we had seen was sufficiently inspiring to encourage us to head for a local hobby shop. We picked up a Dumas* brass drive dog for positive prop engagement, installed

(Continued on page 180)

Don't miss the race of champions sponsored by MRC-Tamiya & R/C Car Action Magazine

On March 9th and 10th, at the RCHTA Show to be held in Pomona, California, a selected group, including some of the country's top drivers, will compete for cash prizes. The prizes will be donated to the winner's favorite charity. This will be a race of driver skill and determination, as each contestant will be driving the same high performance truck. An MRC-Tamiya Toyota Hi-Lux, one of the most powerful high performance racing trucks ever made.

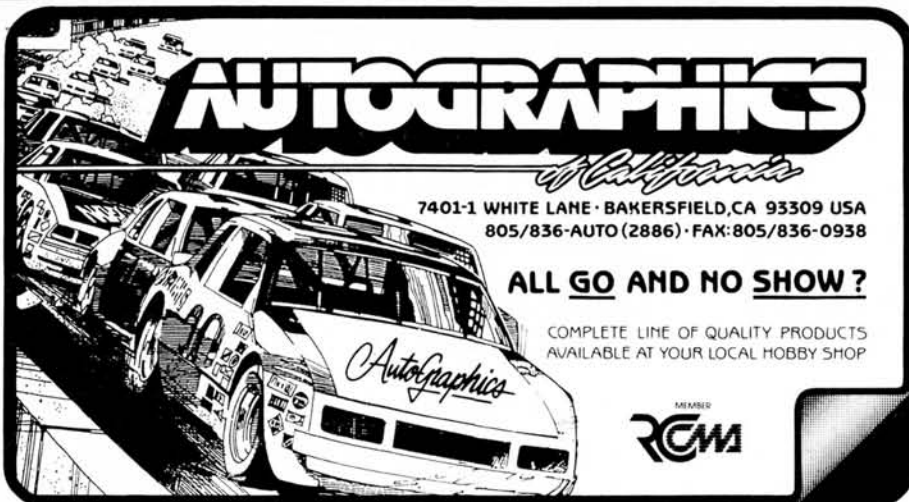
This same MRC-Tamiya Toyota Hi-Lux is available to the general public and can be seen and purchased at your local hobby dealer. For race results keep your eye on R/C Car Action Magazine.



MRC-Tamiya
1/10 scale Toyota
Hi-Lux racing
truck.



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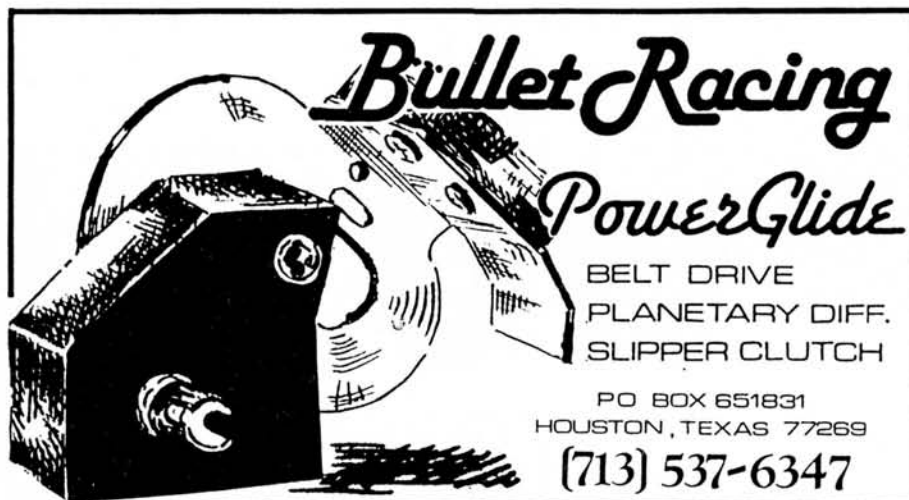
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(713) 537-6347

MRP MISS BUD

(Continued from page 175)

it, and headed back to the pond the next day.

This time, Miss Budweiser flew across the water. Just as we had expected, it turned better to the right than to the left (owing to the position of the metal turn fin on the right sponson). On the straights, when the prop, the sponson tips and very little else was in the water, the twin motors set up a whine that even *sounded* like a turbine. The Bud rocked slightly from side to side as it picked up speed, and this really completed the illusion of full scale. I ran it at full throttle until I could hear the rpm come down and see its speed decrease, and then I headed it for the shore. It had run for about 3 minutes.

I installed the other fully charged packs, and we were off again. This time, we were really haulin' around an imaginary course and planting it right in the groove. While attempting to maneuver around something in the pond, I got Miss Bud sideways and, finally, backwards! As it approached the shore in this decidedly un-scale-like manner, I chopped the throttle just as it hit the beach—at about 15mph! Remember the shear pin that allows the rudder to hinge out

(Continued on page 199)

arrows tyres

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#5256 Ultra-Life Med/Firm Fronts

#5258 Purple Long-Life Fronts

* Not like U.S.A. blue code . . .
these have a much longer wear life!

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#5207 Silver Champion Rears

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WHAT'S NEW



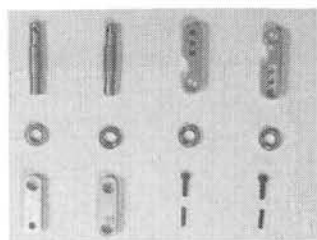
CUSTOM RACING PRODUCTS Body Guard Tape

How many times has your paint been ruined? Use this clear, self-adhesive plastic sheet to protect the paint on Lexan body parts that are likely to crack, chip, or break, e.g., body posts and fenders.

Part no. 2534

Price: \$1.99/30-square-inch sheet

For more information, contact Custom Racing Products, 8784 Plata Lane, Atascadero, CA 93422.



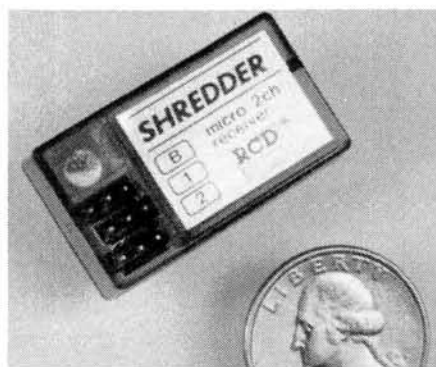
QUANTUM MECHANICS Clod Buster Steering-Improvement Kit

Quantum Mechanics introduces its hottest new product for Clod Buster owners who demand better steering. Using durable, machined-aluminum components and ball bearings, the Clod Buster Steering-Improvement Kit provides frictionless operation. It comes partially assembled, it replaces servo-savers, and it bolts on so you don't have to disassemble the vehicle.

Price: \$79.95

Part no. 1301

For more information, contact Quantum Mechanics, 63 S. Capitol Ave., San Jose, CA 95127.



RADIO CONTROL DEVELOPMENT RCD Shredder

RCD proudly introduces its Shredder micro, 2-channel AM receiver. It uses the finest components (and the latest surface-mount technology) to create the smallest, most affordable receiver for R/C car and boat enthusiasts. Don't let the Shredder's size (0.80x0.56x1.4 inches) and weight (0.70 ounce) fool you; it can handle the pounding of a gas car or a boat. It's also compatible with most 2-channel AM transmitters.

For more information, contact Radio Control Development, Inc., 9419 Abraham Way, Santee, CA 92071.



McALLISTER RACING New Decals

Sometimes, details make a body, and McAllister Racing's new decals couldn't be easier to use. The Toyota GTP and Superspeedway decal sheets have everything, and there are four new mini sheets for those hard-to-find Ford, Chevy, Nissan and Toyota logos.

Part nos. D-222 (Toyota GTP); D-221 (Superspeedway); D-224 (Toyota); D-223 (Nissan); D-226 (Ford); D-225 (Chevrolet).

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.



JG MFG. Chevy Stadium Truck Body

New from JG's truck-conversion lab is the 1990 Chevy, long-wheelbase, stadium-truck body. It was designed specifically for trucks with longer chassis and is available in clear polycarbonate or painted in multicolored patterns.

Part nos. 4018 (clear); 4018P (painted).

Prices: \$19.95; \$36.

For more information, contact JG Mfg., P.O. Box 6014, Whittier, CA 90609.

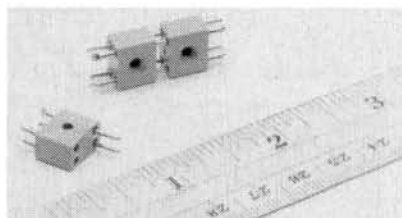


HYPERDRIVE RACING SYSTEMS Tires and Wheels

Mounted and trued on BBS-style wheels, these tires have only one seam, so they resist splitting and separation. Four rear compounds and two front ones are of extended-wear rubber that's graded with the standard yellow, green and blue markings. Also available are one rear and three front compounds of ultra-long-wearing rubber that's graded with gold, silver and black markings. (These will last an average of three to five times longer than standard foams.)

Price: \$24

For more information, contact Hyperdrive Racing Systems, 3210 Howard Nickell Rd., Fayetteville, AR 72703.



BOLD CREATIONS Connectors

These PowerPipe 2 Connectors handle twice as much power as single PowerPipes. They're easier to solder, "reverse-proof," and each has two male and two female pins, so there's no need to buy them in pairs.

Price: \$11.95/pack of 5 (including shrink-tubing); \$55/pack of 25

For more information, contact R/C PowerProducts, Bold Creations, 1305 Abbey Rd., Round Rock, TX 78681.



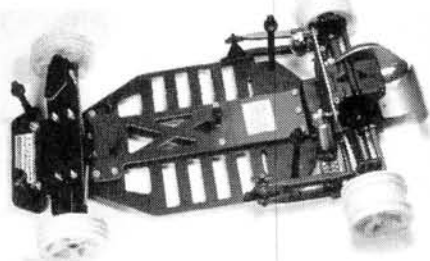
PRO-LINE Striker IV

Pro-Line has added the Striker IV AC-55 to its Striker Series of Indy Profile tires. Owing to its wide-track tread design, this front tire for 2.1-inch wheels is for use on hard surfaces, e.g., asphalt and concrete, but the prototypes tested on a clay-oval track also worked extremely well. Try Pro-Line's Striker IV's in front and Striker I's in the rear.

Part no. 1055

Price: \$8.50/pair

For more information, contact Pro-Line Marketing Division, P.O. Box 849, 40490 RCR 186, West Acres Professional Bldg., Steamboat Springs, CO 80477.



ADVANCED RACING TECHNOLOGY

JR-X2 On-Road Conversion Kit

Use this kit to convert your JR-X2 into an on-road pan-style car for "gear jammer" or "transmission-" class competition. It resembles the RC10 kit, but its chassis has been drilled to accept the JR-X2 transmission and links. A new rear-shock mount is included.

Part no. 9009

Price: \$90

For more information, contact Advanced Racing Technology, 460 Cypress Ln., Ste. F, El Cajon, CA 92020.



WIHA TOOLS

Tool Magnetizer/Demagnetizer

Wiha Tools introduces the Tool Magnetizer/Demagnetizer to its popular line of hand tools. On one side, its powerful magnet (+) will magnetize tools and small parts, and the other side will demagnetize (-) them. Slide one through the box, and it's instantly magnetized or demagnetized. The Magnetizer/Demagnetizer comes in a shatterproof plastic box that measures 2.1x2x1.1 inches.

Part no. 40010

Price: \$7.65

For more information, contact Bondhus Advertising, 1400 E. Broadway, Monticello, MN 55362.

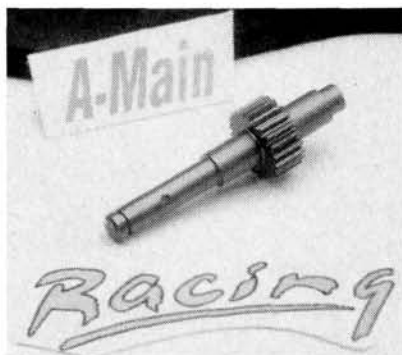


KYOSHO Lamborghini Countach

Kyosho announces its 1/10-scale, electric Lamborghini Countach 25th Anniversary 2WD on-road car. It comes with a speed controller (three speeds forward and one reverse), an electric motor, oil-filled shocks, aluminum shock towers and a durable Kelron chassis. Based on the Kyosho Ultima II chassis, the Lamborghini Countach accepts all the Ultima hop-up parts.

Price: \$199.95

For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

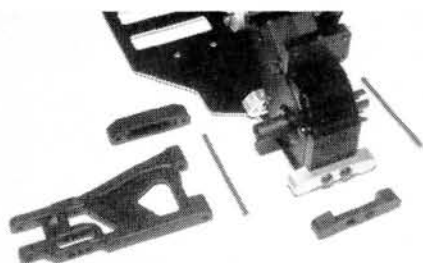


A-MAIN PRODUCTS New Gear

A-Main Racing's exciting new gear for the JR-X2 will increase its top speed, acceleration and run time, and make it perform much more quietly, too. This is all owing to its specially designed gear teeth, bearing-race shoulders and its lower rotating mass (approximately 1/2 ounce less than other gear). This A-Main gear has been hardened to reduce wear, and it's available for the Standard JR-X2 and for the A&L Power Clutch.

For more information, contact A-Main Products, 13426 E. Lakeview Rd., Lakeside, CA 92040.

WHAT'S NEW



GPM RACING PRODUCTS Lazer ZX Rear Lock Plate

For increased strength, bolt one of these strong, alloy locking plates onto your diff case. They're direct replacements for nylon locking plates and can be used without modifying your vehicle. The alloy they're made of provides tighter tolerances than last.

Part no. GPM KL010

Price: \$14

For more information, contact Hobby Etc., 295 D.W. Hwy., Nashua, NH 03060.



PRO-LINE Tire-Tread Technology

The Pro-70 Red Truck Tire is the latest advance in tire-tread technology. The unique grid design reinforces the tire externally and contributes to their overall performance. The combination of mini pins and the grid makes them Pro-Line's most versatile tire yet. The Pro-70 has good traction in "medium to fluffy conditions." For good traction on hard-packed dirt and clay, clip the pins and crossbars down to the grid. The Pro-70 Race Engineered Design (red) Front or Rear Multi Pin with Grid Tires will fit 2.2-inch wheels.

Part no. 7070

Price: \$16.99/pair

For more information, contact Pro-

Line, P.O. Box 849, 40490 RCR 186, West Acres Professional Bldg., Steamboat Springs, CO 80477.



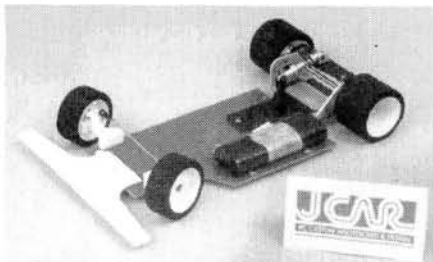
HYPERDRIVE RACING SYSTEMS Hyperballs

Want the hardest precision balls available? Try Grade 9-equivalent diff balls. They make an awesome difference to differential action and are suitable for any ball diff that takes 1/8-inch balls.

Part no. DB 0901

Price: \$3.95/pack of 25

For more information, contact Hyperdrive Racing Systems, 3210 Howard Nickell Rd., Fayetteville, AR 72703.



J-CAR Bolink Invader/MRP GP-10 Oval Chassis

J-Car's new chassis will make your Invader or GP-10 more competitive against the new on-road and oval cars. Just install it (with an Associated 12L front end) on the rear pod assembly, and you'll have a lighter oval car that handles better and is easier to set up. The chassis offers two locations for a 6- or 7-cell flat battery pack, and it comes in black, blue, or red.

Price: \$29

For more information, contact J-Car, 52 Perkins Ave., Norwich, CT 06360.



ROYAL Honda NC30 VFR400R Supersport Super Kit

This Honda motorcycle kit includes an assembled electronic speed controller (with braking), a steering servo and a powerful, gear-driven, Mabuchi motor that drives a maintenance-free drive-belt system. The speed controller is wired for use with Futaba 2-channel systems (J Series). There are detailed, well-illustrated, easy-to-read assembly instructions, and hop-up optional parts are available. The anti-roll training extensions can be easily added or removed, and the unique, patent-pending design features movable ballast to make low-speed, two-wheel handling smooth and realistic. The driver and body fairings are beautifully painted.

Part no. NC30

Price: \$99.95

For more information, contact Royal Products Corp., 790 W. Tennessee Ave., Denver, CO 80223.



PRO-LINE Handy Crystal Case

At the 1991 Chicago Show, Pro-Line introduced its Crystal Case—an addition to its long list of hobby accessories. Developed to provide enthusiasts with an affordable way to protect and organize their crystals, the case holds 11 sets of crystals (or 22 crystals).

Part no. 5324

Price: \$3.95

For more information, contact Pro-Line Marketing Division, P.O. Box 849, 40490 RCR 186, West Acres Professional Bldg., Steamboat Springs, CO 80477.

WHAT'S NEW

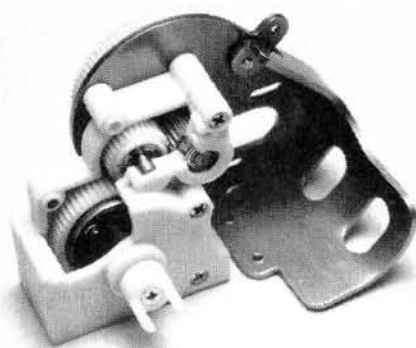


TOWER HOBBIES 1991 Annual Catalogue

Revised and updated for 1991, Tower Hobbies' giant, 20th Anniversary Catalogue includes information on more than 10,000 items for R/C modelers. It has 288 pages filled with exciting products and specialty accessories from more than 300 manufacturers—all at discounted prices. There are also reference charts, helpful hints and "how-to" information. Indexes help you find what you're looking for—quickly, and Accessory Completion Guides provide easy-to-follow checklists of everything you'll need to complete each model.

A catalogue will be included with your first order, or you can buy it for just \$3 (and receive a \$3 discount coupon for your first order).

For more information, contact Tower Hobbies, P.O. Box 778, Champaign, IL 61824. Tel: 1-800-637-4948.



TRAXXAS Transmission Kit

This Traxxas kit enables Eagle owners to bring their trucks up to current racing specs. The ball differential and ball

bearings from the old-style transmission are combined with new parts to build up the TRX Pro Series tranny. The new transmission has an adjustable slipper clutch, 48-pitch gears and a more compact design. Also included are a "rebuild" kit for the ball differential and a new bellcrank steering system. If you buy these parts separately, they'll cost more than \$88.

Part no. 1919

Price: \$50

For more information, contact Traxxas, 12150 Shiloh Rd., Dallas, TX 75228.



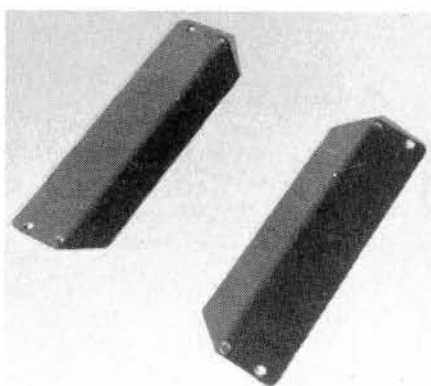
CUSTOM WORKS Pro-Mod Lumina Body

Custom Works' tradition of excellence continues into the '90s with a new series of Pro-Mod bodies, beginning with the Pro-Mod Lumina. Not only does the body improve handling, but it also gives your car a sleek, competitive look that has never before been seen in dirt-oval racing. Its distinctive front end and roof are based on the very popular Chevy Lumina.

Part no. 9005

Price: \$20

For more information, contact Custom Works, 3720 Easton Dr. #7, Bakersfield, CA 93309.



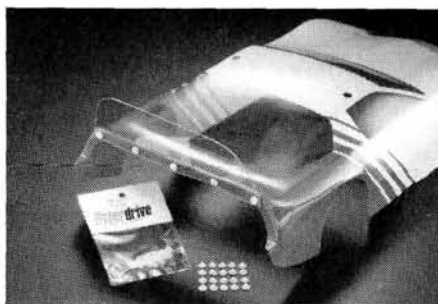
ESP Clod Buster Suspension Stabilizers

By adding lateral support to your stock suspension system, ESP's Suspension Stabilizer Set will improve your Clod's handling and protect its motor from rocks and other debris.

Part no. ESP002

Price: \$8.95/pair

For more information, contact ESP Mfg., 71-5 Virginia Rd., Crystal Lake, IL, 60014.



HYPERDRIVE RACING SYSTEMS Nylon Pop Fasteners

These tough, reusable fasteners have unlimited uses and are especially good for attaching wings and spoilers to cars. They're lighter than tape, bolts, or rivets.

Part no. AC0103

Price: \$1.25/pack of 20

For more information, contact Hyperdrive Racing Systems, 3210 Howard Nickell Rd., Fayetteville, AR 72703.

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MRP MISS BUD

(Continued from page 180)

of harm's way in an "incident"? Beyond any doubt, I proved that it works only as designed, and *not* in the opposite direction (as I had tried to demonstrate)! Scratch one rudder and one prop, and we were grounded

again!

The replacement parts arrived about one week later, and I have about 30 runs on the boat now. When I run it at the local lake, it impresses everyone with its good looks and authentic sounds. Sure, in chop, the deep-vees may have the advantage, but on flat water, this is *the* hot setup.

At about run number 20, I had the misfortune (stupidity?) to try running in chop from which ducks were waving to their onshore ducklings. That's when I discovered something *else* the boat could use: additional flotation! Although the instruction book shows what would normally be

(Continued on page 204)

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CHARGER SPRINT CAR

Scratch-build your own 1/10-scale electric asphalt/carpet outlaw sprint car. This super-light sprung chassis is constructed of flexible music wire and features a changeable wheelbase that allows the use of many body styles. The Charger is fast and maneuverable.



DUSTER 540

Get in on 1/10-scale carpet or on-road action inexpensively with this plan of Eric "Von" Goldschrafe's Duster 540. This car weighs less than three pounds and is constructed of epoxy/fiberglass board and aluminum. Use almost any running gear and suspension left over from junk 1/12- and 1/10-scale cars. Full-size templates make cutting out the chassis easy.

For each blueprint, send check or money order for \$9.95 plus \$1.75 for postage and handling. Foreign payment (including Canada and Mexico) must be made in US funds and drawn on a US bank, or by international money order. Send to:



Radio Control Car Action Plans, 251 Danbury Rd., Wilton, CT 06897.

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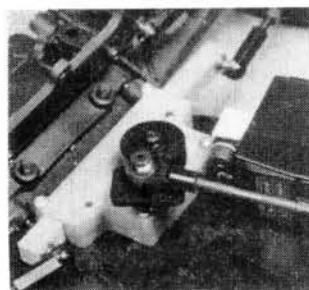
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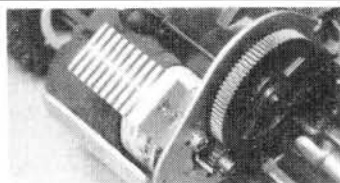


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MRP MISS BUD

(Continued from page 199)

an adequate quantity of foam installed, as an RTR, my boat didn't give me the opportunity to check for its presence. I flipped the boat; it went in stern first; and it barely slowed down on its way to the bottom.

I plan to cut a small hole in each of the sponsons so that I can inject them with foam, if necessary. This problem and that of the prop slippage aren't difficult to solve, and taking into account the enjoyment the boat delivers, they're one-time, curable annoyances rather than real problems.

I originally thought I'd be concerned about the rather short run times, but they're not bad at all. Sure, I'd like to have longer, but, like the wise old racer once said, "If you cross the finish line in 3 minutes while everyone else takes 4, you win!" I'll tip a cool one to that!

The MRP Miss Budweiser is a "fun" boat, and if you're looking for a very fast electric hydro, this Bud's for you!!

*Here are the addresses of the companies mentioned in this article:

MRP, 18676-142 Ave. NE, Woodinville, WA 98072.
Zap/Pacer Technology & Research, 9420 Santa Anita Ave., Rancho Cucamonga, CA 91730.

(Continued on page 206)

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RC10L Super Speedway-----CALL
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RC12L Fiberglass Basic-----\$73.50
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MRP MISS BUD

(Continued from page 204)

Testor Corp., 620 Buckbee St., Rockford, IL 61101.
MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison,
NJ 08818.
Dumas Products, Inc., 909-AM East 17th St., Tuc-
son, AZ 85719. ■

SCOPING OUT

(Continued from page 171)

CONCLUSION

The Tekin ESC 700 is a great choice for Open I Class (14 cells) pulling machines, as well as for other cars and trucks, and its torque control should come in handy when running on slippery dirt ovals or tight roadcourses. The only fault that I found with it was a slight misalignment of the adjustment pots and the holes in the case. The supplied screwdriver can be pushed hard into the hole and *made* to work, but my trusty jewelers' screwdriver worked better. I don't understand why speed controller manufacturers don't make the holes in the case larger (to allow for slight misalignment) and supply rubber

plugs to fit them.

The ESC 700's quasi-high-speed motor-switching pulse will greatly improve your car's slow-speed handling, and it should go a long way toward reducing brush/armature wear. The safety warning on page 19 of Tekin's instruction book sums up this controller's capabilities: "The ESC 700 handles huge amounts of current so easily that if you accidentally short the motor wires while applying throttle, the batteries can explode." That's good advice; be careful and good luck!

**Here are the addresses of the companies mentioned in this article:*

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.
Sermos R/C Snap Connectors, Cedar Corners Stn., P.O. Box 16787, Stamford, CT 06905. ■

SPORTSMAN'S CUP

(Continued from page 95)

1/12-Scale Class with his red, white and blue "Bud Dry" machine. Mike Mayberry's yellow, pink and black "Load Actuators" Agitator XII finished 2nd, and Jeremiah Barrow's silver Sauber Mercedes

finished 3rd.

In the 1/10-Scale category, Todd Olsen put his Nissan RK90 onto a trailer and hauled it to the track with a pickup truck. Todd's use of bright colors and attention to detail (not to mention the trailer) paid off, and he was awarded 1st place. Carlo Bruno received 2nd place for his true-to-scale Miller Porsche, and Stewart Keene's "The Work Shop" was awarded 3rd place. Many of the paint jobs caught my eye, and now I have some ideas for my next body!

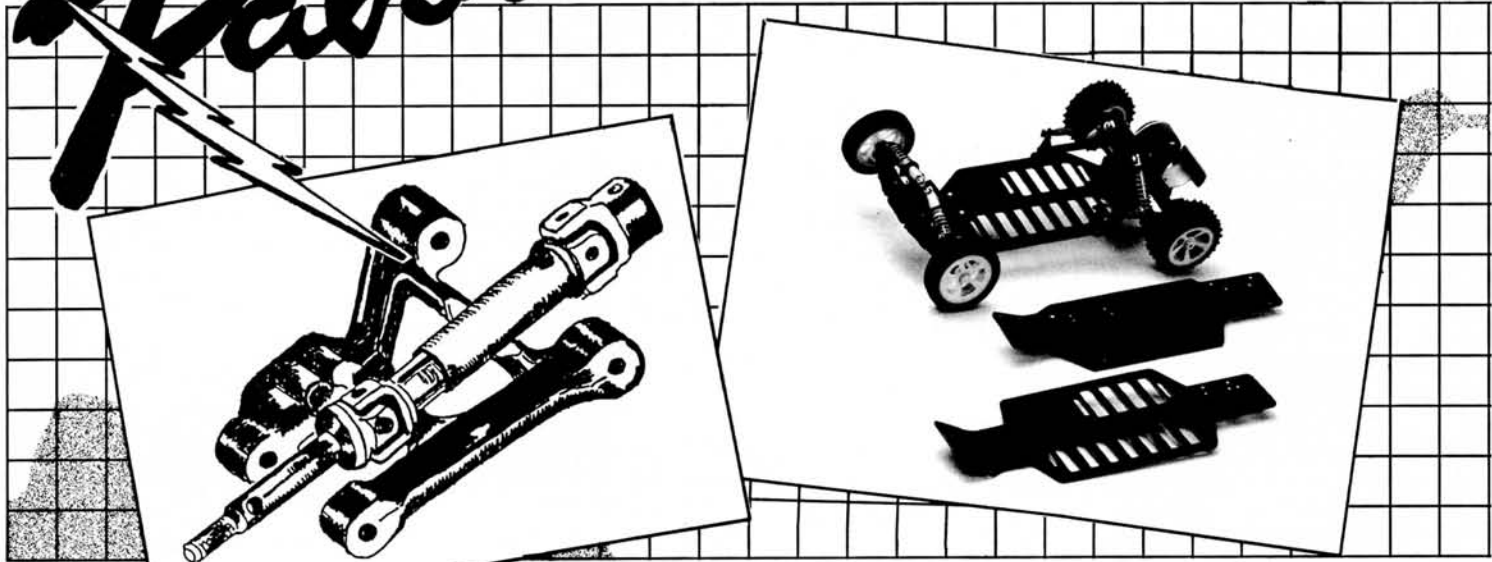
ON-ROAD RACING

During the weekend, the drivers ran in three qualifiers. The pros ran four races, and results from these were combined to determine the winner.

Joel Johnson drove his car as if he were inside it, and he won the first, second and fourth races to become the overall winner. Tyree Phillips, who wasn't more than a yard behind Joel during the entire first race, won the third race. Although Tyree drove superbly throughout the event, he had to settle for 2nd place overall. There was confusion over who finished 3rd—three drivers were tied! Kent Clausen, Frank Calandra and Gil Losi Jr. had to share the 3rd-place trophy. (Continued on page 218)



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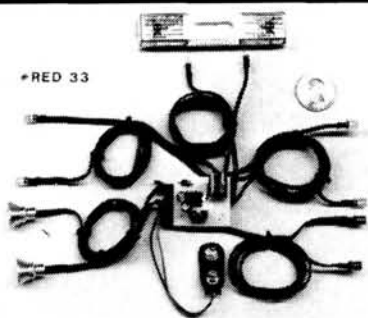
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SPORTSMAN'S CUP

(Continued from page 206)

Because of his results in all three Sportsman Cup amateur races, Rob Press was awarded the Triad Cup. (After seeing him perform at this event, I understood why he won.) Joel Johnson won the Triad Cup in the Invitational Class, adding yet another trophy to his collection!

Congratulations to amateur drivers Willy Decker and Bill Goldsmith for their victories in the 1/12- and 1/10-Scale On-

Road Races.

I thank everyone who made this event possible (forgive me if I leave anyone out): Ernie Provetti, Kevin Mauer, Dave Willems of Trinity; "Pops" Losi and everyone else at the Ranch; ROAR Administrator John Thawley; Tyree Phillips of Novak Electronics (for his seminar on speed controllers); Kent Clausen and Mike Lavacot of Lavco (for their seminar on

Lavco's product line); Frank Calandra of Class; all the racers who were kind enough to help fellow racers in the pits; and last, but certainly not least, Phred Gebauer for his colorful racing commentary. ■



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